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Comb-Honey Display Cases	White Glass Jars
Comb-Honey Paper Shipping Cases	White Glass Tumblers
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Plain Tin Cans	60-lb. Square Cans

Write for Circular giving prices

A. I. ROOT COMPANY OF CHICAGO

224-226 W. HURON ST. CHICAGO, ILL.

Free--500 Italian Queens--Free

To beekeepers ordering sections in 1000 lots. With each order of 1000 No. 2 grade 4¼x4¼x1⅞ two-beeway sections we will give you free a pure mated Italian queen. Our prices are the lowest and quality backed by our guarantee of "perfect satisfaction or money back." This offer holds good to the first 500 orders, or until July 31, 1925. This free offer is only on the above size and grade of sections. Extra queens can be purchased for $1.00 each.

SECTIONS A bronze bee pin on apple blossom (new design) free with each purchase of the following sections in lots of 500 and 1000 (only one pin on 1000 because of cheaper rate). Expires July 31.

Grade.	Size.	Price per 500.	Price per 1000.
No. 1	4¼x4¼x1⅞ two-beeway	$5.85	$11.35
No. 1	4 x5 x1⅜ plain	5.35	10.40
No. 2	4 x5 x1⅜ plain	4.70	9.40
No. 1	4¼x4¼x1½ plain	5.35	10.40
No. 2	4¼x4¼x1½ plain	4.70	9.40

FOUNDATION With each purchase of 10 or 25 pounds of Muth's High-Quality Comb Foundation we will give you one of these wonderful bee pins. There is no advertisement on the pin and you will be mighty glad to own one, as well as being highly pleased with our quality. This free offer also expires July 31.

Size.	5-lb. boxes.	25-lb. lots.	No. sheets to lb.
Heavy brood	65c per lb.	60c per lb.	6 to 6½
Medium brood	70c per lb.	65c per lb.	7½ to 8
Thin surplus	75c per lb.	70c per lb.	27 to 29

MUTH'S SUPPLIES ARE CHEAPER IN PRICE AND OF THE HIGHEST QUALITY, BACKED BY THIS HOUSE OF 50 YEARS IN THE BEE SUPPLY BUSINESS.

The Fred W. Muth Co.

Pearl and Walnut Sts. ***Cincinnati, Ohio***

——SEND FOR OUR 1925 CATALOG——

---------- TEAR OFF HERE ----------

Date.....

The Fred W. Muth Co., Cincinnati, Ohio.

Gentlemen:—Please send me by freight (express or parcel post)..... Thousand No. 2 4¼x4¼x1⅞ two-beeway sections with one free Italian Queen with each 1000 sections, ordered at your low price of $10.60 per 1000.

Also send to me.....pounds of.....foundation at.....per pound with one bronze bee pin like cut free.

(If you want our 1925 catalog mark X.....here.)

Yours truly,

Name .....

Post Office .....

Shipping Point .....

HONEY MARKETS

U. S. GOVERNMENT MARKET REPORT. Information from Producing Areas (first half of June).

CALIFORNIA POINTS: Southern California—Light rains reported early in the month. Along the coast buckwheat has made good growth and should yield well. Very little button or black sage is in sight, but white sage is coming into bloom and should yield a fair amount of honey in San Diego County, probably more than last year. Some sage honey has already been extracted. In Riverside County little flow is expected from sage or buckwheat. Orange honey is perhaps even scarcer on the whole than last year. The orange crop for the entire state is estimated at 15,000 cases. Most yields ran 15 to 20 lbs. per colony. Riverside County beekeepers are generally asking 12-14c per lb. for white orange extracted in large lots, 15c per lb. in case lots, but some small lots have been sold locally for 11-12c per lb. Small lots white sage have sold at 10-12c per lb., with dealers offering 9c per lb. for light amber sage. Beeswax has sold at 26-30c per lb. In the Imperial Valley the honey flow is on but bees find it difficult to work due to high winds. In fact many bees are unable to get back to the hive when they do venture out, as a result of the wind. Buyers are already inquiring for honey. Central California—The season is considered three weeks later than normal. Prospects look favorable for a late flow of dark honey. Swarming is over. Bees are in good shape where extracting of the early flow was not too close. Northern California—The star thistle has started to bloom lightly, and if the summer is hot it should yield heavily. Rain continues to fall. Fruit bloom extracted honey has sold at 6½-7½c per lb.

PACIFIC NORTHWEST.—Much alfalfa winter-killed in the eastern part of Washington and Oregon, and prospects for a crop are poor. Cold, cloudy, windy weather has made prospects still poorer. Bees are not building up well. Further west, bees are working on first crop alfalfa, which is yielding well. Few sales extracted honey reported at 10-12c per lb. in 5 and 10 lb. pails.

INTERMOUNTAIN REGIONS—Conditions spotted. Recent heavy rains have brightened crop prospects in most sections, and early hot weather might yet result in a large yield; but northern Colorado reports lack of moisture. Several sections anticipate shortage in irrigation water. Stores have been short, and where feeding has not been done many bees have died. Alfalfa is just starting to bloom, and yellow sweet clover and mustard are yielding in a few sections, but weather conditions have not permitted bees to work on them much. Yet conditions are considerably earlier on the whole than normal. The honey in this territory is very largely sold and gone, and carlot orders coming in can not be filled. A few cases of off-grade comb honey sold at $4.00 per case; small pails white extracted at 10-13c per lb., 60s, 11c per lb. Beeswax, 28-30c per lb.

ARIZONA—In spite of the dry weather, the mesquite flow has been one of the heaviest in years, but catsclaw flow is less satisfactory. Cold weather checked alfalfa flow for a couple of weeks, but it has resumed. Bloom is abundant in alfalfa districts.

TEXAS—Recent rains have only slightly helped conditions and very few beekeepers expect a normal surplus. In a small district in central Texas prospects for a cotton crop seem to have improved, but reporters in the south central cotton belt advise that serious drouth continues, cotton has not been planted, all plant life is drying up, and many colonies are being shipped to more favorable locations. The second flow from mesquite did not generally materialize due to high winds and continued drouth, and in most areas there will be little more honey until cotton in the fall. Recent prices have varied widely. In 60-lb. cans sales have been made at 8-11c per lb.; 10s, 10-12c per lb.; bulk comb, which is mostly cleaned up, 12½-18c, according to container, mostly 15-17c per lb. Beeswax, 28-30c per lb., according to color.

PLAINS AREA—Continued dry weather has been broken by rains which will insure a crop from clover and sweet clover where plants are not too far gone to recover. White clover has been cut down by recent frosts in some sections, and high winds have also been unfavorable for bee activities. Basswood is reported yielding some nectar. Southern Illinois and nearby territory still needs rain to keep clover in bloom, and fall plants are also drying up. Old honey is very largely exhausted. One lot white extracted sold at 9½c per lb. Good demand for beeswax, which has sold at 33-35c per lb.

EAST CENTRAL AND NORTH CENTRAL STATES—Clover is in full bloom, much earlier than normal, but it has been very dry, following late frosts, and recent rains will only lessen the extent of the crop shortage, except in the northern part of the area. Unless rains come soon the period of bloom will be cut very short over much of the district. Some sections report favorable prospects for fall flow. Very little old honey available. Few 60s white extracted sold at 12-14c per lb., light amber, 10½-11c per lb. Beeswax has sold at 30c per lb.

NORTHEASTERN STATES—In New York 10 days of very hot weather, added to the long drouth, has so injured clover that a very small flow is looked for unless rains come soon. The situation is better in Pennsylvania, but even there rain must fall if the clover crop is not to be cut short. Northern Vermont reports that clover and raspberry should furnish a good honey crop this season. Many bees in the fruit belt were killed by spray and dust poison; and other colonies were injured by bees being chilled at work. Little early fruit bloom was gathered, and much feeding has been necessary. Very little old honey remains unsold. Few sales white clover, ton lots, 11c per lb.; 60s, 13c; No. 1 white clover comb, $4.50 per case.

PORTO RICO (Last half of May)—During the week ending May 23 shipments from Porto Rico totaled 1531 gallons (18,372 lbs.) of honey and 460 lbs. of beeswax.

From Producers' Associations

TORONTO—There still remains a fair demand for honey of all grades, and market conditions should be in good shape before this season's crop comes in. We are gradually getting cleaned up. All reports from our producers indicate that bees are in first-class condition. Some spring dwindling is reported, but on the whole, colonies have come through the very cool spell we have had in fine condition. Clover and pasture have been retarded in growth by the cool weather but are now coming along fast with every prospect of a good yield. We only need warm weather and a reasonable rainfall to insure a good crop.

The Ontario Honey Producers' Co-op., Ltd.,
Toronto, Ont., June 4. A. G. Halstead, Mgr.

SAN ANTONIO, TEXAS—The honey crop conditions in Texas are still very doubtful on account of continued drouth in most of the beekeeping territories. In a small district of central Texas prospects for a cotton crop seem to have improved, but in the territory as a whole little prospect is held out for a normal surplus. The second flow from the mesquite did not materialize on account of high wind and continued drouth. Prices are ruling very firm. Wholesale basis, extracted honey 11c, bulk comb honey 16c. Bulk comb honey is about cleaned up and there seem to be more buyers than sellers. Extracted honey is not moving very freely on account of low price of sugar; but no anxiety is felt over maintenance of present price level on account of shortage of crop. Texas Honey Producers' Ass'n.
E. G. LeStourgeon, Mgr.
San Antonio, Tex., June 9.

(Continued on page 476.)

Special Foreign Quotations

LIVERPOOL, ENG.—Since our last report the market has been very quiet with few transactions. This is a usual occurrence at this season of the year, and matters are not improved by the general bad trade prevalent. The value works out at 12½-13c per lb. in American currency. Beeswax: In this article we have a good firm market, and business has been done at about 41-42c in American currency.

Taylor & Co.

Liverpool, Eng., June 5.

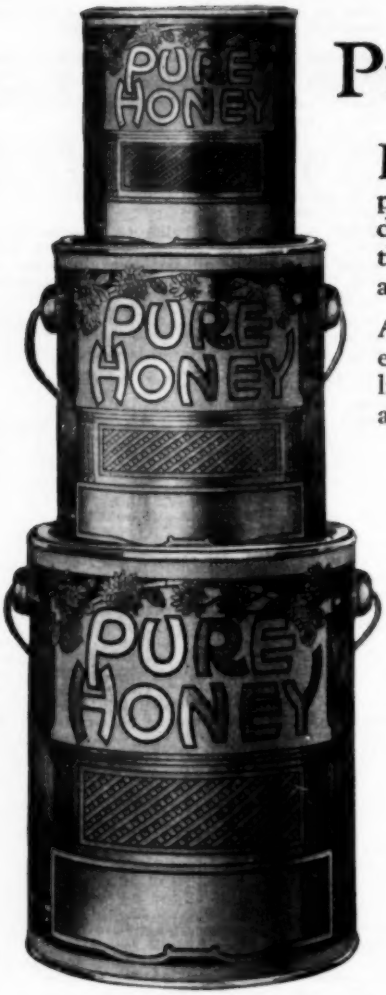
Report of Honey Producers

Early in June we sent the following questions to actual honey producers:

1. How does the honey flow thus far, if any, compare with normal in your locality? Give answer in per cent.
2. What is your estimate now of the 1925 honey crop as compared with the average for your locality? Give answer in per cent.
3. At what price has honey been sold, if any, in large lots (carload or less) in your locality during the past month? (a) Extracted honey, per lb.? (b) Comb honey, fancy and No. 1, per case?
4. What are prices when sold to grocers in case lots? (a) Extracted honey in 5-lb. pails, or other retail packages in terms of 5-lb. pails? (b) Comb honey, fancy and No. 1, per case?
5. What is the retail price to consumers in your locality? (a) Extracted honey in 5-lb. pails or other retail packages in terms of 5-lb. pails? (b) Comb honey, fancy and No. 1, per section?
6. Is there any of last year's honey left in the hands of producers in your locality? If so, what per cent of the crop is carried over?

The following answers were received:

State.	Reported by:	Honey Flow.	Honey Crop.	Carlot prices. Ex.	Comb.	In small lots. Ex.	Comb.	Retail prices. Ex.	Comb.	Unsold.
Ala.	W. D. Achord	100	75	$.08				$.80		10
Ala.	J. M. Cutts	40	35							
Ark.	Jas. Johnson	100	100			$1.00		1.25	$.28	0
Ark.	J. V. Ormond	75	80							0
Cal.	M. C. Richter	110	120					1.50		0
Cal.	Geo. Larinan	25	25					1.00		0
Cal.	L. L. Andrews	20	20			1.00				1
Cal.	M. A. Saylor	100	100			.75	4.80	.90	.30	0
Col.	B. W. Hopper	100	100							0
Col.	J. A. Green	100	80			.75		.95		
Conn.	Allen Latham					1.00	6.50	1.25	.35	
Conn.	A. W. Yates	100	100			1.00	7.50	1.30	.40	0
Fla.	C. C. Cook	100	100	.08		.80		1.00		0
Fla.	Harry Hewitt	75	80			.80		1.00		0
Ga.	J. J. Wilder	100	100	.12½		.90	5.75			0
Ill.	C. F. Bender	20	15						.30	0
Ind.	Jay Smith	25	25					1.05	.35	0
Ind.	T. C. Johnson	25	30			1.00	4.90	1.15	.28	0
Ind.	E. S. Miller	50				1.00	5.75	1.25	.30	10
Iowa.	W. S. Pangburn	110	100							10
Iowa.	E. G. Brown		90	.10		.75		1.00	.25	2
Iowa.	F. Coverdale	100	125					1.00	.25	0
Kans.	J. A. Nininger	100	100			.75	5.00	.95	.25	0
La.	E. C. Davis	65	85	.09½		.65		.85		0
Md.	S. G. Crocker	100	90							5
Mass.	Dr. B. N. Gates	100	100							2
Mich.	L. S. Griggs	5	10			.75	5.00			2
Mich.	Floyd Markham	10	0					1.25		0
Mich.	I. D. Bartlett	0	50					1.00		0
Mich.	E. D. Townsend		50							0
Mich.	B. F. Kindig	80	60							
Minn.	Francis Jager	150	150	.11		.80		1.00		
Mo.	J. H. Fisbeck	125	125			1.00		1.25		0
Mo.	J. M. Romberger	80	80			.80	6.00	1.00	.30	0
Neb.	J. H. Wagner	100	100			.65		.90		5
N.J.	E. G. Carr	100	100							0
N.Y.	Geo. B. Howe							1.00		
N.Y.	Adams & Myers		50					1.10		
N.C.	W. J. Martin	100	100	.10	3.50	1.00	4.50	1.25	.35	0
Ohio.	R. D. Hiatt	90	75			1.00	6.00	1.35	.35	0
Ohio.	J. F. Moore	50	50					1.25	.30	0
Ohio.	F. Leininger	10	0							0
Okla.	Jos. Heueisen	90	80					1.75	.35	0
Okla.	C. F. Stiles	10	20			.90	6.00	1.15	.33	0
Ore.	H. A. Scullen	100	100					1.00	.25	25
Pa.	C. N. Greene	100	100					.90	.30	0
Pa.	D. C. Gilham	105	100			1.05	7.20	1.40	.40	4
Pa.	H. Beaver		100			.70		.80		0
S.C.	E. S. Prevost	80	80			1.00		1.25	.35	0
S.D.	L. A Syverud	100	100			.67	4.50	.95	.25	
Tenn.	J. M. Buchanan	25	25							
Tex.	H. B. Parks	100	100	.10		.70		.80		0
Tex.	T. A. Bowden	15	15			.80		1.05		5
Tex.	J. N. Mayes	40	75			.60	7.50	.70		0
Utah.	M. A. Gill	100	100			.60				
Vt.	J. E. Crane	80	100			1.25	5.50	1.50	.35	
Va.	T. C. Asher	90	100			1.10	6.00	1.25	.35	0
Wash.	W. L. Cox	100	100					1.00	.30	0
Wash.	G. W. B. Saxton	100	85			.60		.70		5
W.Va.	T. K. Massie	5	20					1.20	.35	0
Wis.	N. E. France		90					1.00	.23	0
Wis.	F. Hassinger	100				.80		1.00		0
Wis.	H. F. Wilson	0	25					1.15	.35	0
Wyo.	A. D. Brown	100	90							0
Wyo.	C. H. Ranney	25	75							0



Prize Winners

FIRST prize among Association displays, and second prize in individual display, were won with the help of these Canco decorated honey pails—at the Ohio State Fair last fall.

Are you taking advantage of these efficient silent salesmen? The complete line of Canco decorated honey cans and pails is distributed by:

COLORADO HONEY PRODUCERS ASSOCIATION
Denver, Col.

DADANT & SONS
Hamilton, Ill.

G. B. LEWIS COMPANY
Watertown, Wis.

10 Tivoli Street, Albany, N.Y.

408-10 12th St., Lynchburg, Va.

844 N. Front Street
Memphis, Tenn.

23 W. 3rd St., Sioux City, Iowa

415 S. St. Francis Street
Wichita, Kan.

B. F. SMITH, JR.
Fromberg, Mont.

Samples and details on request

Three sizes—2½ pound cans, 5 and 10 pound pails. Colors—gold and green and red, in a brilliant and appropriate design.

American Can Company

New York Chicago San Francisco Portland, Ore.

American Can

CONTAINERS OF TIN PLATE · BLACK IRON · GALVANIZED IRON · FIBRE

TRADE CANCO MARK

Container Prices That Talk

The most complete line of Honey Containers offered anywhere.
Root's Lithographed Honey Pail can be had with a soldered or cemented seam.

Prices on Lithographed Cans and Pails

	Soldered seam.	Cemented seam.
2½-pound Lithographed Can, less than 500	$7.90 per 100	$7.50 per 100
2½-pound Lithographed Can, 500 or over	7.50 per 100	7.15 per 100
5-pound Lithographed Pail, less than 500	13.45 per 100	13.00 per 100
5-pound Lithographed Pail, 500 or over	12.75 per 100	12.30 per 100
10-pound Lithographed Pail, less than 500	17.20 per 100	16.50 per 100
10-pound Lithographed Pail, 500 or over	16.30 per 100	15.70 per 100

5 and 10 lb. pails, soldered or cemented seam, without bail, at $1.50 less per 100.

Cans and pails with cement seam can be furnished lacquered inside for an additional 40c, 65c, and $1.00 per 100, respectively, on the three sizes. Shipped from factory in eastern Pennsylvania in lots of not less than 100.

Tin Containers Not Lithographed

	Cat. No.	No. in case.	Per case.	Ship. wt.	Cat. No.	No. in carton.	Per cart.	Ship. wt.
2½-lb. can, 4 x 4 9-16	F4324	24	$1.25	16 lbs.	F4300	100	$4.20	35 lbs.
5-lb. pail, 5x5¾	F4312	12	1.05	13 lbs.	F4350	50	3.45	29 lbs.
10-lb. pail, 6¼x7⅛	F4306	6	.85	12 lbs.	F4330	30	3.10	28 lbs.
10-lb. pail	F4450	50	4.90	45 lbs.				

Cartons for Comb Honey

Style of Carton.	Size of Carton. 4¼x1⅞	4¼x1½	4x5x1⅜	Price per 100	500	Ship. Wt. 100
Folding Cartons, printed, new design	F7274	F7273	F7275	$1.00	$4.10	6 lbs.
Folding Cartons, printed, old design	F7284	F7283	F7285	1.00	4.10	6 lbs.

For printing name and address on cartons, add: 100, $1.50; 500, $2.25; 100, $3.00.

White Glass Tumblers

White glass tumblers, 48 in case shipping weight 20 lbs. Price per case.....$1.35

White Glass Jars

	Ship. wt.	Price 1 case.	6 cases.
8-oz. honey capacity round jar, 24 in case	12 lbs.	$1.00	$5.90
16-oz. honey capacity round jar, 24 in case	18 lbs.	1.30	7.50
32-oz. honey capacity round jar, 12 in case	15 lbs.	.95	5.25
48-oz. honey capacity round jar, 12 in case	15 lbs.	1.05	6.00

Comb-Honey Shipping Display Cases

For 24-section sizes.	In flat, with nails, 2-in. glass, in lots of 10	50	Ship. Wt. 10	50
Single tier, 4¼x4¼x1⅞	F2740	$4.80	$23.50	49	240
Single tier 4¼x4¼x1½	F2730	4.50	22.00	42	210
Single tier 4 x5 x1⅜	F2750	4.50	22.00	43	205

Single tier cases for sections 4¼x4¾x1⅜, 3⅝x5x1½ furnished from Medina in lots of 100 or more at same price as for single tier cases for sections 4¼x4¼x1⅞. Regular 24-section double-tiered shipping display cases for 4¼x1⅞ sections can be furnished on order at $3.00 per 100 above the single-tier, in lots of 100 or more.

Comb-Honey Corrugated Shipping Cases

Corrugated Paper Shipping Cases, for 4¼x4¼x1⅞ sections, per 10, $2.20; 100, $21.00
Corrugated Paper Shipping Cases, for 4¼x4¼x1½ sections, per 10, 2.00; 100, 19.00
Corrugated Paper Shipping Cases, for 4 x5 x1⅜ sections, per 10, 1.90; 100, 18.00
Silicate of Soda for sealing.....1 gallon, 60c; ½ gallon, 35c; 1 quart, 20c

"Quality that Lasts"

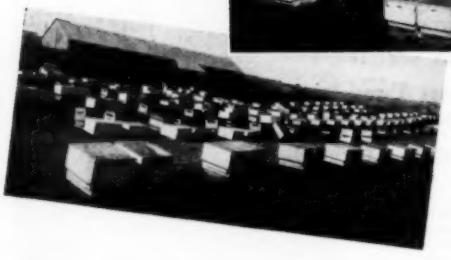
Root QUALITY BEE SUPPLIES

The A. I. Root Co.
Medina, Ohio, U. S. A.

Root QUALITY BEE SUPPLIES

"We use about 1,000 pounds of Wired Foundation a year and are very highly pleased with the perfect combs produced"
---E. L. Hofmann

He further says: "If other beekeepers have been as successful with Wired Foundation as we have been in drawing out thousands of combs in old-style Dadant frames, you will likely have a tremendous demand. Our new combs in these large frames averaged more than ten pounds of honey per comb. The season was an extremely hot one here, but there was no sagging at all. Wired foundation surely fills a long-felt want."



Above are two of the Hofmann apiaries at Janesville, Minnesota. The central extracting-plant and the general equipment of these bee-yards are among the best and most efficient in the world.

It is this kind of combs drawn from Wired Foundation, in his big frames, that gives Hofmann his immense honey-producing colonies.

If you think beekeeping is going to the bow-wows, visit E. L. Hofmann, at Janesville, Minnesota, and your pessimism will be knocked galley west. There is no guesswork in his beekeeping. "My aim is to get the largest crops of honey possible with the least expense," Hofmann says. His good crops of honey from 700 colonies are proof of the success of his methods. In economy he sees service first—so his equipment in chosen for results. **It is significant that Wired Foundation is a part of his standard equipment.**

When you plan your foundation buying consider what this means to you

DADANT'S WIRED NON SAG FOUNDATION

Dadant & Sons, Hamilton, Illinois

Makers of Dadant's Famous Foundation
Wired—Plain—Surplus
Sold by dealers everywhere—Write for name of nearest dealer.

DADANT'S WIRED NON SAG FOUNDATION

BEESWAX—We pay 33c cash, 35c in trade (f. o. b.) Hamilton, Illinois, or Keokuk, Iowa, for your wax. Send it now before the moths get it.

GLEANINGS IN BEE CULTURE
JULY, 1925

EDITORIAL

OUR CORNERSTONE

REMEMBER at all times that improved bee culture is our end and aim, and we trust no one will hesitate to give any facts from experience because they may tend to overthrow any particular person or "hobby." If any of our special plans don't work, or if anything we advertise has had its value overestimated, here in these pages is the place of all others to set the error right.—From A. I. Root's "introductory" in the first issue of Gleanings in Bee Culture January 1, 1873.

IN localities where the drouth has cut the honey crop short, good management from this time on will be necessary to prevent the colonies from going into winter in poor condition. When nectar is scarce brood-rearing is often reduced and old queens are permitted to remain instead of being superseded by the bees. Furthermore, the beekeeper in his desire to have as much surplus as possible is inclined to be less liberal in leaving abundant stores, thus compelling the bees to reduce brood-rearing during August and September, when the bees that live through the winter should be reared. If increase has been made, many colonies, especially the swarms, are liable to be short of stores during this critical brood-rearing period of August and September. Of course, a generous fall honey flow would correct this, but in most localities there is no dependable fall honey flow.

Management During Poor Seasons

In some cases an even greater danger to the colonies is in the discouragement of their owners. In many cases bees are kept as a side line and during poor seasons it is quite natural for the beekeeper to turn most of his attention to something that is more profitable and neglect the bees. To be a successful beekeeper, one must be an optimist, always building for next season.

A little attention now, such as replacing inferior queens with good young ones, and arranging that each colony shall have an abundance of food during August and September, may bring large returns next year. When the honey crop is short, it often happens that the most profitable work a beekeeper can do this month is that of requeening all colonies which do not already have good queens.

FREEZING temperatures late in May, followed by extreme heat the first week in June, have wrought havoc with the clovers in portions of the clover region. In some localities the clover was cut down and the heads blackened by the freeze just as it began to yield freely, then the great heat, together with the drouth, came on before it had an opportunity to recover from the damage by frost. However, in the western portion of the white and alsike clover region, especially in Minnesota, Iowa, and portions of Wisconsin, timely rains have apparently saved the situation so that crops above the average are expected. Good yields are reported in the states along the Atlantic coast from Florida to Massachusetts. In the sweet clover region of the upper Missouri River valley there has been much rain during the past few weeks and prospects are reported to be excellent. In the irrigated region, where alfalfa and sweet clover furnish the surplus, prospects are somewhat spotted, a few cases of shortage of water for irrigation being reported. In Washington, Oregon, and northern California good yields are reported, while southern California has harvested a very short crop. In portions of Texas, New Mexico, and Arizona good crops have already been taken, but in portions of Texas the yield is reported to be short.

Honey Crop Conditions

It is too early to estimate how the honey crop for the entire United States will compare with last year. An outstanding feature this season is the short honey flow in a belt running north and south through the white clover region, including western New York, Ohio, Michigan, Indiana, and Illinois, where prospects for a good crop were most promising in May. But the recent rains may yet change the situation somewhat in this region, especially in the northern portion.

THE unusual amount of vacant comb in the hives the latter part of May in many localities this season revealed imperfections in the brood-combs that would ordinarily pass by unnoticed. The use of the food-chamber, and also permitting the queen free range into the second story during the peak of spring brood-rearing, also helps to reveal the imperfections in the brood-combs in the lower hive-body.

Defective Combs Often Unnoticed

Most beekeepers have become so accustomed to seeing a strip of honey in the upper portion of the brood-combs that but little attention is paid to the suitability of these cells for brood-rearing, since they are usually filled with honey. In many localities this strip of honey in the upper portion of the brood-combs disappeared during the cold weather of May when the bees were not able to obtain a living from the fields, revealing the stretched cells in the upper portion of the combs which were avoided by the queen in her rounds of egg-laying, and which the bees were unable to fill with early-gathered honey on account of weather conditions.

The advent of comb foundation made possible straight combs which can readily be handled and returned to the hive in any position, instead of having to be put back in a certain position on account of irregularities, as was often the case before the days of comb foundation. But many of these beautiful straight combs have several rows of cells in the upper portion that are so badly stretched out of shape that they can not be used for brood-rearing. The use of such combs virtually results in flattening down the brood area, making an unduly shallow brood-nest. Of course, the stretched cells are useful as containers of honey, but they often stand in the way of free expansion of the work of the colony into the supers; and when the queen is permitted free range in two stories these stretched cells help to form a barrier between the brood-rearing area in the lower story and that of the upper story. These imperfect combs, therefore, not only stand in the way of unrestricted brood-rearing, but also often increase the tendency to swarm, as well as bringing about conditions which may result in a stagnation of work in the colony on account of the rim of honey between the brood and the super. Mr. Pettit's slogan, "The Brood-chamber for Brood," can not be put into practice with such combs. One of the great steps in advance in beekeeping during recent years is the growing realization of the value of perfect combs in the brood-chamber, and the advent of non-sagging foundation is one of the milestones in the progress of the industry.

Those who have hundreds of combs built on full sheets of foundation in wired frames, that are perfect in every respect except having stretched cells near the top-bars, can make good combs out of them when found empty, as they were in many localities early in June. This is done by cutting along a row of cells lengthwise of the frame below the stretched portion and taking out a strip usually about two inches wide and the length of the frame, then cutting a strip from the lower portion of another comb to fit into this space. After the bees have fastened this patch in place, such combs are very strong, since the patch, being taken from the brood area of another comb, is strengthened by cocoons to the top-bar. In this way two good combs can be made from three that have stretched cells at the top, and in some cases three good combs can be made from four such combs.

ON page 435 in this issue Mr. Byer calls attention to the losses that come about through fermentation of honey and points out some of the causes of this trouble. To have well-ripened honey deteriorate after it has been taken from the hives and before it has been extracted is indeed unfortunate, especially since this can be prevented by the proper care of the honey while in storage or by extracting it immediately after taking it from the hives. Not only is it possible for well-ripened honey to absorb moisture after it has been taken from the hives, but this sometimes occurs while the honey is still in the care of the bees. Under some conditions honey improves by being left on the hive for several weeks after it has been sealed. During dry weather honey that is left with a strong colony for some time after it has been sealed becomes richer in flavor and heavier in body. On the other hand, it often happens that the population of the colonies is greatly reduced after the close of the honey flow, and if a large number of supers has been tiered up during the honey flow the honey may not be properly covered by bees during cool nights. Under such conditions, well-ripened honey may absorb considerable moisture through the cappings. If the unprotected honey becomes cold during the night, and warm moisture-laden air comes in contact with it the next day, condensation takes place on the cappings. Under such conditions it would be better to take off the honey and either extract

Fermentation in Honey

it immediately or store it in a heated room to prevent deterioration.

The problem of fermentation in honey offers a rich field for careful investigation. Unfortunately, but little work has been done along this line. The dividing line between honey that is sufficiently heavy in body to prevent fermentation and that which is thin enough to ferment has not been clearly defined. Apparently many factors enter into the problem, such as the character of the honey flow, the source of the nectar, the care of the honey while on the hives and after its removal from the hives. Honey that is sufficiently heavy in body to prevent fermentation under some conditions may cause trouble under other conditions. Apparently honey that is gathered slowly, especially toward the close of the season, is more liable to ferment than is honey that is gathered rapidly during the height of the honey flow. Possibly a larger number of the spores which cause fermentation are carried in with the honey when the amount of nectar in each flower is small than when the amount of nectar is large, just as more coloring matter is often present in honey gathered during a slow honey flow than in that gathered during a rapid honey flow. The amount of exposure of honey to the air during the process of extracting no doubt also enters into the problem, since a greater exposure would afford greater opportunity for spores of fermentation to be collected in the honey.

E. R. ROOT, who is now spending his second summer on a Redpath Chautauqua Circuit giving a lecture on bees and honey, together with demonstrations of the bees themselves, every day to thousands of people in an effort to break down the ignorance and prejudice regarding the purity of honey, writes that he is questioned every day by people who would like to use more honey if they could be convinced as to its purity. In many cases people tell him that they no longer use honey because they learned that a neighboring beekeeper had purchased sugar to feed the bees. Strange as it may seem to beekeepers, the suspicion of the public is aroused as to the purity of honey as soon as it is learned that a beekeeper has fed his colonies sugar syrup. They do not understand that sugar syrup is fed only in an emergency to prevent starvation when a colony runs short of stores and is not able to obtain a supply of food from the field, or that in some cases in the extreme north sugar syrup is used for the winter stores for the bees when the quality of honey for wintering is not the best.

Popular Ideas Concerning Honey

No doubt much of this silly talk would be passed around even if beekeepers had never been known to feed an ounce of sugar syrup to the bees, but it is extremely unfortunate that it ever becomes necessary for a beekeeper to purchase sugar to feed his bees, since this gives ground for their suspicions. Apparently it does but little good to explain that, even if the pure food laws did not prohibit the sale of this as honey, it could not be produced with profit and that beekeepers feed sugar syrup only at times when the bees need this for their own food supply. The outstanding things in the minds of many unthinking persons are that beekeepers sometimes purchase sugar to feed their colonies and that they sell honey; so they immediately conclude that the honey must be made from sugar. The fact that the beekeepeer may buy a few hundred pounds of sugar and sell many tons of honey does not correct the suspicion or stop the silly talk.

This is one of many reasons why beekeepers should leave an abundance of honey with the bees instead of taking it away too close and take a chance on having to purchase sugar to tide the colonies over until nectar is again available from the flowers. With few exceptions, about the only excuse for feeding sugar syrup to bees are those cases in the far north where it may be necessary to feed sugar syrup for winter stores on account of the honey being of questionable quality for the bees during their long winter confinement without a cleansing flight. Furthermore, every pound of honey that is taken away from the bees and put on the market with the probability of having to replace it with a pound of sugar is putting that much more burden on the honey market and helping out the sugar market, to say nothing of the added labor of taking away the honey and replacing it with a sugar syrup.

The best way to make sure of an ample supply for the bees is to have combs filled with honey in an upper story during the main honey flow. It is not safe to depend upon a sufficient supply being stored in the brood-chamber, no matter what its size may be, unless there is a dependable fall honey flow which will leave the brood-chamber heavy with honey at its close. Whether these combs of honey are left with the bees in an upper story (food-chamber) or are exchanged with light combs in the brood-chamber does not matter. The important thing is to have a great abundance of stores left with the bees, regardless of the amount of surplus secured.

XUM

SHORT CUTS IN HONEY PRODUCTION

By Morley Pettit

The Battle of Foodstuffs in the Markets of Today Necessitates Lower Production Costs and Better Merchandizing

Mr. Byer, on page 302, May Gleanings, revives a question of economics much discussed during the war-time period of high prices: Is a producer better off because he gets higher prices when everything he has to buy is higher? If I may say it without invoking an argument, I think he is, especially if he has learned such improved methods as to reduce the cost of production. By that means his income is so increased by his increased production that he can pay higher prices for the necessaries of life and still have a greater surplus for the luxuries.

Twenty years ago, how many beekeepers ever dreamed of being able to drive about in a carriage which cost many hundreds or some thousands of dollars? A buggy for about $85.00 and a horse for the same, was the limit of most of us. The motor car is just one of many luxuries which have become necessities to beekeepers because it is just one of the many inventions which have so reduced the cost of honey production in the last twenty years that we can afford to accept even as low a price as we did then and still live as comfortably as we do now in spite of modern high prices for all we have to buy. That does not mean that we are satisfied with low prices, for so long as Mr. Byer and I keep our health we feel that we are worthy of better and better rewards for our labor and experience as the years go by. And with our accumulation of experience we have an enormous advantage over the beginner.

Like Mr. Byer, "I have faith in beekeeping as a means of giving a good living and a bit more if one works hard and has a fair location. But with foulbrood to fight on every quarter, reduced prices for honey, and heavy operating expenses, I certainly do not think that beekeeping is a sinecure, and under existing conditions"—right there the road forks and I shall bear in a different direction from Mr. Byer. He says, "We have no thought of further increasing production." That might work in the United States with a high protective tariff and a national policy of self-sufficiency, but in Canada where we must more or less compete with the world I believe we shall be compelled to bend every effort to reduce the cost of production and of merchandising, so as to enable us to meet the increasing competition, not so much of other beekeepers as of the producers of other foods. During the war I used to hear of the commercial war which was to follow the military one. I think most of us understand better now than we did then what the expression meant. There is now raging a battle of foodstuffs as well as a battle of other commodities, and no compact or advice to curtail production of any one is going to help that one a particle without the co-operation of the producers of all others. As yet no Sapiro has arisen to cope with so gigantic a problem, so it would seem that the best we can do is to produce as good an article as we can—as cheaply as we can—then sell it to the best advantage possible.

Of course it is not fair to the young hopefuls who expect wise guidance from their teachers to paint the prospects in ultra-rosy colors; but to my way of thinking, most teachers and writers are overlooking a greater menace to beekeeping than that of over-production, and that is overcrowding of the pasture. We are

The G yard, Pettit Apiaries, in an alsike and sweet clover locality. This is used for package bees, since the location is too much exposed for good results in wintering, even when a wind screen is used.

in one respect in a different position from any other producers, unless it be stock raisers on open range. We can not fence our ranges and the industry is at the mercy of unwise or unfair persons who crowd bees in on territory which is already well occupied. It is a difficult problem which has been often discussed but never very satisfactorily settled. However, I did not start out to write on this subject more than an introduction to some ways by which we can cut the cost of production, and so meet the rising competition, not so much of other beekeepers (for we should co-operate with them), but of other food-producers with whom it is too much to hope to co-operate at present.

In regard to Mr. Byer's letter on comparative honey prices in the June issue, I want to say that twenty years ago at least one buyer who is still prominent was getting first-class clover honey at a bulk price of six cents, and I once sold to him at that price in 60-lb. tins that I had supplied. While Canadian prices have ranged higher than United States prices until recent years, I think we should base a comparison on the fact that from the same class of producers who would sell at 10½ cents now, he could have bought at 6 cents then. As regards cost-cutting methods and inventions, there are surely very few beekeepers who were so far ahead of their times twenty years ago that they have not made any improvement since.

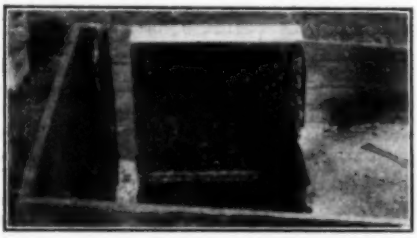
Keeping in Close Touch with Condition of Colonies

On the management of the colonies during the honey flow there are two extremes of manipulations to be avoided. These are absolute neglect and wasteful manipulation. With no danger of a brood disease, the former may under some conditions be profitable. But who is in no danger of a brood disease in the United States or Canada? More than once I have had S. O. S. calls from men who had been keeping large numbers of colonies on a "let-alone plan," because they had no disease and could get good returns for labor and investment in that way; but disease had crept in unobserved, and they suddenly realized that the danger of infection was scattered—they had no idea how far—through their thousands of extracting supers. Of course the Hutzelman discovery immediately suggests itself as the best way out; but while sympathizing sincerely with the man in trouble, I can not help congratulating myself on the system of frequent visits to the brood-chamber, for which I have been sometimes criticised, but which enables us to keep cases of disease down to a very small percentage indeed.

All through the storing period I believe it pays to see every colony once in ten days at the outside. Disease is detected and nipped in the bud, and so is the swarming impulse. These two accomplishments are a sufficient reward, and in addition supering is given the best of attention and failing queens may be replaced promptly. For queen-cell detection there is nothing like a double brood-chamber. John McKinnon impressed the idea on me when he told of managing something like five hundred colonies with practically no help. I do not see yet how it is going to fit in with my queen-rearing system; but it will certainly save an enormous amount of time and be almost as good as looking over every comb. He simply leaves his hives two-story twelve months in the year and gives supers with the excluders above the two. It is well known that the bees prefer to build queen-cells in the middle of the brood-nest if a space is provided there. With the queen occupying the two stories it is

The J yard, Pettit apiaries, sheltered on all sides except the south. An artificial windbreak is not needed here.

a simple matter to tip the upper one and examine the lower edges of its combs. It is merely the old Heddon system of queen-cell detection applied to modern conditions. The supposition is that the queen is gradually crowded down into the lower story as the season advances,



Colony in winter packing-case with food-chamber tipped up to look for queen-cells on the first examination in May.

so that the upper again becomes a food-chamber for winter. I know that others are using similar methods, and how it works out in my case I will be in a position to say in a year or so.

Should Food-Chambers Have Standard-Depth Frames?

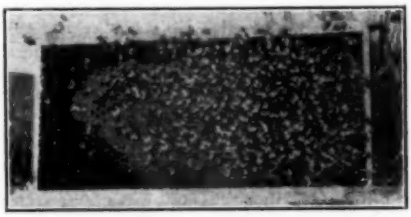
This is being written the first of June, and the season so far in Ontario has been like last in some respects. Early warm weather stimulated brood-rearing and heavy consumption of stores, then cool weather in May cut off storing and in many cases feeding had to be resorted to. This means that many colonies, which did not actually starve, restricted brood-rearing to save themselves. In our own yards we had very few cases of actual starving, but most colonies are in first-class condition, thanks to food-chambers which were drained almost to the last drop of honey to produce the good colonies of young bees which are now looking forward to the clover flow.

This repeated experience with shallow food-chambers would seem like another link in the chain of evidence to prove that the food-chamber should be not a shallow, but simply another full-depth brood-chamber according to the teaching of some. It interested me very much, in view of some recent criticisms, to be told by beekeepers farther north than this at a demonstration yesterday, that my shallow food-chambers are too small. I did not object, but replied that we had wintered about 140 colonies with full-depth food-chambers and found they wintered just as well and built up better in spring with much less attention. The point is to have good queens and heavy packing. This, combined with the food-chamber, insures ample stores, room for breeding, and good colonies for the honey flow, and saves a great deal of labor at various seasons.

There is another condition which convinces me that the fears of those who oppose the food-chamber are unfounded. Where the shallow combs were cleared of honey and occupied by the queen, as they were in most colonies in May, the queen goes back and forth freely between the shallow combs above and the Langstroth combs below, and just as freely between the shallow combs and the deeper Jumbo combs where they are in use. There is no doubt that shallow top-bars, such as we use, with worker cells right up to them, have much to do with bringing about this desirable condition. In other words, by great care in getting combs well built, and by culling out the ones which stretch, I have rescued another feature of the Heddon system, approximately perfect combs, which was a very important factor in the success of his cell-detection method.

Good Combs Help Cut Cost of Production

Since some of us have been working and harping on the matter of better combs for the brood-chamber, particularly with reference to stretching along the top, the Roots and Dadants have come to our rescue with three-ply and wired foundation. These are both valuable inventions calculated to cut the cost of honey production; but for best results either should be used in a well-wired frame, with shallow top-bar and one wire close to it, supported in the middle, to



Brood in comb having stretched cells in upper portion. Note the unused rows of cells just below the top-bar.

The upper wire is supported in the middle by a staple driven into the top-bar. When the wires are well embedded no other fastening of the foundation is needed. Note the spacing staple and shallow top-bar.

save the needless labor of fastening the foundation to the top-bar.

For getting combs built, there is no time like the tail-end of the honey flow, especially if a fall flow may be expected. The bees are producing wax freely then, and if swarming has been prevented the colonies are very crowded. Just as long as clover honey is coming in rapidly, I like to keep adding empty combs until each colony has enough comb space to hold nearly all it may be expected to store before much capping is done. When more storage may be needed (but probably will not), place a super of foundation next to the brood-chamber, with the honey supers above. Surplus young bees will move right in on this and start drawing it out, but not much honey will be stored there until the honey supers are pretty well filled and sealed. By that time, if we are so fortunate as to have a continuation of the clover honey flow, storing will proceed in real earnest in the foundation super and another may be placed under it. The supers containing unripe honey are left to be finished on fall honey, and we have that many new sets of combs without much cost for the drawing out. In fact, results are better where the supers are finished off with foundation than when combs are used to the end.

I do not know where this will end, as, up to the present, increase and culling have made it desirable to have more combs built each year. I still have poor combs, and even drone combs to use over excluders. I believe it would pay to discard them all and use nothing anywhere but first-class combs. How often we see drone comb kept empty in a super where the workers wish to persuade the queen to come up and rear drones! How often we put a stretched comb into a brood-chamber because of a shortage of perfect combs! If I ever get all the combs I want, then I will start melting up poor combs in real earnest; but it seems that the more supers we have the more honey we get, and with a love of life, and of a bit of jam on the bread-and-butter of life, we still strive to increase production by cutting the cost of production, and to increase profits by cutting the cost of merchandising, believing with our Mr. Halstead that Providence would not overproduce anything so desirable as honey.

Georgetown, Ont.

FERMENTATION IN HONEY

By J. L. Byer

Some of the Causes of this Trouble and How to Prevent it

Last winter, while having lunch in Toronto, a "knight of the grip" who knows me as a beekeeper, told me about seeing a large consignment of honey the week before, that had been shipped away and then returned because fermentation developed. He stated that it was being heated and then sold for manufacturing purposes. The amount ran up into several tons, and while the exact figure amounts to little in this discussion, it did set me to thinking as to the large annual loss that occurs each season because honey is placed on the market in an unripened condition. It was unquestionably good business for this honey-selling organization to have that honey returned, provided it could not be sold where it was for manufacturing purposes at a price as good as could be received later after freight charges were added; but what about the transaction so far as the producer of the honey is concerned? It was surely an unprofitable and unsatisfactory deal for all concerned, and one that should be avoided in the future if at all possible. I believe that in the great majority of cases it can be avoided.

A few years ago I called at the home of a very dear friend and a very fine beekeeper. I shall never forget the feeling that went over me when he took me into a large room and showed some tons of honey in pails that was dissatisfied with the containers it was in and was showing this discontent by creeping out of every possible crevice that could be found between cover and top edge of pails.

About two years ago I was walking through the wholesale district in Toronto, and a wholesale man, who knows me quite well, called me in to look at a large lot of honey he had received recently. In this case the honey was in about the condition of the other lots I have described, and this was from a very good friend of mine and a man who has produced many tons of honey.

Before going further let me say that I am not writing this at all in the spirit of criticism, and the unfortunate beekeepers who have had their honey ferment have my sincere sympathy. The point I am trying to make is that unripe honey is no new development and that good beekeepers occasionally get caught, as well as new men in the game.

I hesitate to say much about my own experience, as I have been so fortunate so far that what I say might appear to

be boastful, and another season might take away all feelings of security if things should happen to go wrong. With production running up into carloads annually, I have had a report of only one case of fermented honey. That was from a private customer in the West who has bought tons of honey from me in past years. Some honey was shipped to this man in the fall of 1922, and in the spring of the year following he wrote me that one case of "fives" showed slight signs of fermentation on top. This honey was largely from the second crop of alfalfa and was extracted in September when the supers were removed, and I blamed it to that. We were glad to hear of the trouble—not glad that the honey had fermented, but pleased for an opportunity to replace it. Now, more of our honey during the past twenty years may have fermented, but if it did we never heard about it. So I think I am safe in again saying that we have indeed been extremely lucky so far.

Deterioration After Being Removed from the Hives

As to the reasons for honey going wrong in the two cases I have mentioned, I made careful inquiry from both these men and in both cases honey had been placed in an unheated room and allowed to stand for quite a length of time before it was extracted. As near as I could figure out from memory, we had damp cool weather during the time the honey was stored previous to being extracted. Assuming that the honey was fairly well sealed, I make the guess that the deterioriation took place in that time, and accounted for the trouble after the honey was in the pails. Remember that both of these men were seasoned beekeepers, before making any other guess as to cause of the trouble.

But honey that is damaged in that way comprises but a very small fraction of the quantity that annually goes wrong, and, in plain English, the bulk of this is extracted too soon or, in other words, in a green condition. Sweet clover is largely responsible for this condition of affairs in many localities. Sweet clover honey does not necessarily ferment any sooner than other kinds of honey if treated right, but other reasons which I will explain bring on the trouble.

Effect of Introduction of Sweet Clover

Formerly, before sweet clover was grown, alsike was the main crop and the honey flow was over by July 10 or 20 at the latest. Buckwheat comes in about August 5 as a rule, and the intervening time gave a chance to have all clover honey ripened on the hives and removed before buckwheat started to yield. Compared with that condition of affairs, what do we find now? Sweet clover yields all through July and early August, and often by the time buckwheat starts to yield the sweet clover is yielding as heavily as at any time in the season. The beekeeper is anxious to get off as much white honey as he can, and the inevitable happens.

We are just like others in being anxious to get off as much white honey as possible, but we are very anxious not to get any honey in pails that will give trouble later on, and consequently take great care to avoid such a result if at all possible. In removing honey with escapes at that time, we can not avoid taking off some green honey. Right here is where the central extracting plant is so very useful that it makes that system worth while to us even if it had disadvantages as compared with the old system of extracting at the out-yards and putting honey into containers at once.

Central Extracting Plant Reduces Danger of Fermentation

Honey is brought to the central plant to be extracted. We have the honey room heated at this time and large tanks are used so that we can leave several tons of honey in storage before being forced to put it into pails. The result is that any thin honey will rise to the top of the tanks in the warm temperature of the room and this thin honey is easily noted and cared for. All this thin honey, which amounts to but little some seasons and quite a lot in others, is carefully looked after and sold on its merits for manufacturing uses right away.

Yes, the disposal of this thin honey for manufacturing purposes means a lower price for a few hundred or a few thousand pounds of honey, as the case may be. But better that than to ship honey away, have it returned, pay freight twice, and then after a lot of worry and trouble, sell all at a low price in the end. Possibly no other single factor causes more trouble in honey sales than to have shipments go wrong in the way I have described; and it is a good business principle, not to mention higher motives towards the fraternity in general, for the individual producer to declare war on green honey at every turn.

Assuming that all extracted-honey producers understand the necessity of having enough supers on hand to be able to produce a good quality of honey, I have said nothing on that phase of the subject or indeed anything in the way of general equipment. Where only a small number of colonies is kept and the owner can give immediate attention when it is required, a minimum of at least two extracting supers per colony is imperative. Where larger numbers are handled and

outyards are necessary, nothing less than a minimum of three supers per colony will prove adequate. In removing supers before buckwheat yields, we always have on hand an empty super to place under the bee-escape board on each colony as the clover honey is shut off from the bees.

Seasoned beekeepers, many of whom know infinitely more about the game of honey production than I do, will please bear with me in what I have written. It is something with which they are all familiar. This article is written for the good of the industry at large, and especially for the younger ones in the game, all of whom are anxious to avoid the pitfalls many of us have fallen into in times past.

Markham, Ont.

AN ARGUMENT FOR BETTER GRADING

By J. E. Crane

Why it Pays Well to Grade Honey with Great Care

City markets are always interesting and whether in Boston, New York, Chicago, Washington, or San Francisco, I have found much to interest me. The markets are one of the first things I want to visit when I go to a large city. I like to see the fruits and flowers, vegetables, and meats, as well as other things too numerous to mention, all placed so as to attract attention. Apples and oranges are graded so perfectly in size that they can be piled in pyramids like cannonballs. Plain products are displayed in such a way as to be attractive.

A groceryman said to me a day or two ago, that it is not much trouble to sell goods if they are of such a character as to attract attention. Honey is no exception to this rule. I have seen honey piled up in a store just as it was taken from the hive, in the super in which it was stored, with sections well coated with propolis, without regard to color or neatness.

Honey is not of much value unless we can sell it; and the price we can get for it will depend a good deal on how well it is graded and how attractive we can make it.

Factors Involved in Grading

There is not much difficulty in grading extracted honey, especially when sold in bulk, for it goes either by its color, or the source from which it was gathered, or both. Thus we have water white, white, light amber, and amber or dark. Also clover, buckwheat, basswood, orange, or palmetto.

With section honey it is different. Not only must we consider the source and color of the honey, but the sections, whether white and clean; the combs, whether traveled-stained or not; how well filled and capped; and last, and by no means least, the weight. The federal pure-food law now makes it necessary to place on every package to be retailed the net weight when shipped in interstate commerce.

Apples, pears, oranges, and other fruits are graded according to size, color, and flavor. We grade honey in much the same way, except that, instead of size, we consider weight.

Weighing Sections of Comb Honey

Color and finish of section, as well as flavor, are important, and, so far as I know, pretty well looked after; but when we come to weighing each section separately many beekeepers balk and mark all, "Minimum net weight 10 ounces." The thought of weighing all their sections one by one seems like a good deal of a job, and a profitless one, too; and I confess it is a good deal of work to weigh off ten or twenty thousand sections and place each weight in a case by itself, so every case will be filled with sections of the same weight; but I believe it pays, and pays well. Suppose it takes a man, whom we are paying $4.00 per day, five days to weigh off 10,000 sections. It would amount to $20.00 clean cash, which seems a good deal for weighing our honey. But, supposing we get even twenty-five cents a case more for our 500 cases, that would amount to $125, which would pay for the weighing and leave us over $100 for our care in packing, besides the satisfaction of placing our honey on the market in the best shape to secure the highest price.

A man who had spent a considerable amount of time in the New York market remarked: "Large apples and small ones in the same barrel sell as culls, but if the large ones are in one barrel and the small ones in another, both will sell for No. 1's." Why not the same with honey?

Again, there would seem to be an injustice to the consumer when sections of different weights are placed in the same case to be retailed at the same price, for the buyer that happened to get a light eleven-ounce section would pay 25 or 30 per cent more for his honey than one who secured a section weighing fifteen ounces.

It is also an injustice to the producer, for the retail merchant can not afford to

pay as much for honey packed with four or five different weights in the same case as for cases of even weights.

Bees do their work so well that a twelve-ounce section looks about as well as a fifteen-ounce section if shown by itself; but if placed by the side of the heavy one it looks rather lean and cheap, and would sell better in a case where all are twelve-ounce sections.

No orange-grower would think of packing large and small oranges in the same box, for he wants the best price for his fruit.

I am pleased to be able to quote the following from the U. S. Department of Agriculture's Semi-monthy Market Report for Dec. 15: "Vermont 20-section cases, carton stock, white clover, 14 oz., $6.00; 12-oz., $5.00-5.50; 10-oz., $4.25."

It is easily seen that if 20-section cases bring $6.00, a 24-section case would sell for $7.20, which I believe is the highest price quoted in the United States.

Hurrah! We are coming into our own. "The world do move!"

Corrugated-Paper Shipping Cases

We have been using for the past fifteen or twenty years corrugated-paper shipping cases in which to pack our honey when properly graded. We have found them a great saving. We commenced using them, hoping they might help prevent breakage. In this we have found them very satisfactory. But there are other advantages worth mentioning. An active man can set up one a minute. How long will it take a man to put together a wooden case? They are very strong and can be piled one on top of another as high as desired; indeed, a heavy man can stand on one without danger of crushing it. They are much less expensive. When bought of manufacturers in quantity they are usually less than half the price of wooden cases in the flat. Some years we have saved four and even five hundred dollars in first cost by using them instead of wooden cases. Of course, we buy of those who manufacture them and in quantity.

Whether sections shall be placed in cartons, each one must decide for himself. Certain it is, no one should use them to cover up poor or partly filled sections.

Middlebury, Vt.

DISINFECTING DISEASED COMBS

By Geo. E. King

Assistant Instructor, University of Illinois

Results of Experiments with Various Disinfectants, Including One Made up of Formalin, Water, and Soap

For half a century or more beekeepers have experimented with various chemicals in the attempt to find a cure for foul brood. Now that formaldehyde has become generally recognized as the one disinfectant which seems best adaptable for the treatment of American foul brood, it is interesting to notice earlier reports of its application to this use. The reasons for its early failures are readily apparent. In Gleanings in Bee Culture, Vol. 27, No. 8, p. 310 (April 15, 1899) under the title "A New Treatment for Foul Brood," by "Rambler," we read:

> Whenever you find foul brood in a comb, uncap it and wash it all out under a faucet of water running with considerable force. When thoroughly washed, shake out the water as clean as possible; then make a solution of one teaspoonful of formalin to one quart of water. Spray the cells full of this solution; place the combs in a pile, and allow them to remain two days; then shake out the solution and return the combs to the hive. * * * I can readily understand that, where the germ becomes dried down in the bottom of a cell, or where it is covered with honey, fumigation or slight spraying would have no affect; but by putting said germ to soak for several days there is a chance of rendering it open to the influence of the proper drug.

The work of Dr. G. F. White (U. S. D. A. Bul. No. 809) published in 1920, first suggested to the writer the possibility of successfully using formalin for treating American foul brood. In reporting his tests with formalin on the spores of American foul brood Dr. White (p. 32) says:

> In 5 and 10 per cent solutions, respectively, of formalin (37 per cent formaldehyde) it was found that they were viable after 6 hours, and in a 20 per cent solution they were alive after 30 minutes. While the spores were alive in the formalin suspensions after these periods, the evidences obtained indicate that the chemical death point was being reached. * * * As the destruction of the spores with formalin is a question of hours only, it is possible in well selected cases that use could be made of this agent.

Dr. J. C. Hutzelman first reported in Gleanings for December, 1922, the successful application of formalin, in an alcoholic solution, for the disinfection of brood-combs infected with American foul brood. Soon afterward (Gleanings, February, 1923) Prof. H. F. Wilson reported the successful employment of a sodium hypochlorite solution for the same purpose. The latter solution, in a commercial form known as "Be-Helth," has also been recommended for sterilizing honey to be fed back to the bees. In a report of laboratory experiments (Gleanings, June, 1924) Prof. Dan H. Jones, of Ontario,

comments unfavorably upon sodium hypochlorite as a disinfectant for American foul brood, but states that formalin in a 20 per cent or stronger solution kills the spores of *Bacillus larvae* within 48 hours.

The efficiency of the alcohol-formalin solution as a disinfectant for American foul brood has been well established, but there are good reasons for searching further for a solution which is cheaper, noninflammable, and dependable. With this end in view, as well as to try out for comparison under practical apiary conditions the solutions recommended by Dr. Hutzelman and Prof. Wilson, during the summer of 1924 the writer carried on experiments in which he used sodium hypochlorite, alcohol-formalin, and a solution of formalin and water for the treatment of American foul brood. This work was done in the apiary of the University of Illinois.*

Sodium Hypochlorite

Combs (Langstroth size) from supers used on colonies found affected with American foul brood, after uncapping and extracting, were carefully sprayed with undiluted "Be-Helth," as the directions for its use indicated, all of the comb-surfaces being covered by the solution. The next day the bees from healthy colonies were shaken onto these combs. Throughout the rest of the summer no disease appeared in the colonies on combs so treated.

Later, in a feeding test, six ounces of "Be-Helth" was added to one gallon of a mixture composed of equal parts of water and honey that was known to be heavily infected with spores of American foul brood. This mixture was well stirred and allowed to stand 24 hours before being fed to the bees. The colony selected for this feeding test was one having combs previously sprayed with "Be-Helth" in the preceding experiment, and having considerable brood of all ages, apparently all healthy. Within two weeks from the time this "medicated honey" was first fed back to this colony, dead brood appeared in many brood-cells. When carefully examined later this dead brood was found to have all of the gross distinguishing characteristics of American foul brood, except that it was considerably paler-colored than is usual in this disease. Microscopic examination of the dead brood in all stages revealed the presence of enormous numbers of *Bacillus larvae*, the causative organism of American foul brood. The infectious and insidious nature of this case was amply shown by its increasing intensity in this colony during the remainder of the season.

It is apparent from these tests that the sodium hypochlorite solution can not, in all cases, be depended upon to sterilize combs or honey. This test does not conclusively prove whether the failure was with the sprayed combs, or with the infected honey treated with "Be-Helth," though it was presumably with the latter. The significant thing is that the causative organisms survived either the one or other treatment. Incidentally, the "Be-Helth" corroded all wires and other metal surfaces with which it came in contact. It softened the propolis and, to a certain degree, cleansed the combs, and bleached all clothing it touched. The chlorine odor, though apparently harmless to the bees, is a repellant to them so that they avoid the combs bearing this odor.

The Alcohol-formalin Solution

Brood-combs bearing numerous scales of American foul brood, after all cells were uncapped and the honey removed, were immersed in alcohol-formalin (Hutzelman's) solution for 48 hours. It was observed that the solution is very irritating and disagreeable to use, but it dissolves propolis and other foreign materials from the frames and combs, leaving them clean and in good condition. Metals are not affected by it. Bees shaken from healthy colonies onto the treated combs accepted them readily and reared healthy brood in them throughout the remainder of the season.

The cost of treating brood-combs with the alcohol-formalin solution is not prohibitive, but it is considerable. The active ingredient is the formaldehyde; the alcohol serves as a carrier and penetrant, as well as a cleaning agent.

A Water-Formalin-Soap Solution

The laboratory tests by Prof. Dan H. Jones indicated that, theoretically at least, it should be possible to get complete disinfection of brood-combs by the use of a 20 per cent formaldehyde solution (formalin and water). However, it still remained to be proven that such a solution could be successfully employed in practical apiary work. The following tests were therefore conducted to give information on this point.

A solution of commercial formalin, one part by volume to four parts of water, was first tried out, but only with difficulty could it be induced to enter the brood-cells. To overcome this trouble the employment of a "spreader," as is common in orchard and field spraying, suggested itself. Of the common spreaders, ordinary soap appeared to be the most promising. Sufficient soap was then added to

* The writer is deeply indebted to Prof. C. L. Metcalf, head of the Department of Entomology, for his consent to the carrying on of these investigations and for materials and apparatus used.

the solution to form suds (about 1 lb. to 5 gallons of solution), and infected brood-combs were immersed in it precisely as they were in the alcohol-formalin solution. The 20 per cent formalin-water-soap solution readily enters the brood cells, driving out the air rather well, but less completely than does the alcohol-formalin. By lightly jarring the disinfecting tank most of the air in the cells was displaced, but not all of it. After a 48-hour treatment the solution was extracted from the brood-combs and, at the end of a short period of drying, the bees from a healthy colony were shaken onto them. At the time the combs bore a strong formaldehyde odor, but the bees accepted them readily and were apparently unharmed. Unfortunately the lack of sufficient material permitted this test to be carried out with but one colony. This colony, however, was examined carefully at intervals during a period of seven weeks after being placed on these treated combs. Not a single dead or diseased larva or pupa was found during that time, although considerable brood was constantly present, and honey not superabundant.

The question naturally arises, as to how thorough the disinfection would be in a contaminated cell into which the liquid fails to enter. It must be acknowledged that where such a cell is uncapped the air in it is fully exposed to the solution and after a time this air will become saturated not only with water vapor but with formaldehyde as well, and will remain so saturated as long as the comb is kept immersed in the solution. It appears, moreover, that the formaldehyde, to some degree at least, penetrates the wax, as the odor remains in the wax for some time after washing the combs in fresh water. According to this, then, all spores of American foul brood should be readily reached by such a treatment. The period of 48 hours may or may not always be sufficient to effect sterilization. More work is needed to determine this point.

Effect of Formalin on Sealed Honey

Combs of capped honey, contaminated with *Bacillus larvae*, were soaked for three weeks in the formalin-water-soap solution and then given to the colony used in the previously mentioned feeding test. Nothing as to the infectiousness or sterility of the honey was learned, but the death of a considerable number of bees that fed on the honey proved conclusively that where formalin is used to disinfect combs, all cells *must be uncapped and the honey removed.*

These results give us insufficient data to permit us to conclude that the solution (water, 4 gallons; formalin, 37%, 1 gallon; laundry soap, 1 lb.) employed in this work is superior, or even equal, to the alcohol-formalin solution. The writer hopes to experiment further with it during the season of 1925. At present, however, he can only feel that the solution he has used gives promise of being thoroughly practical, and as compared with alcohol-formalin it is much less costly, less disagreeable to use, is not inflammable, may be prepared at home, and evaporates less rapidly. This solution loosens but does not dissolve the propolis and scales of dead brood, and metals are unaffected by it. The dead brood scales are cleaned out by the bees after the combs are returned to them.

By this report it is not intended that beekeepers forsake well tried methods for this or any other method of unproved value. It is safer and better to be overcautious than to rush rashly into anything that is still in the experimental stage. It is hoped, however, that further tests will yield results as promising as these preliminary experiments.

Urbana, Ill.

THE RACES OF BEES

By Phillip J. Baldensperger

The Tellians or Native Black Bees of Northern Africa, Sometimes Called Tunisians or Punics

Apis mellifica unicolor; var. *intermissa*. The French naturalist Latreille first described the black bee of Madagascar as one-colored, in 1804. The black bee is found over a part of Central Africa, but more especially known to modern beekeepers in the French provinces of North Africa. The German zoologist, H. v. Buttel-Reepen, added the name of *Intermissa* in 1906. He found that the bee on the African continent was an intermediate species between the heather bee of northwestern Germany and the one-colored black bee of Madagascar.

Frank Benton, on a visit to Tunis in 1883, brought some queens with him and called them Tunisians. He sent a few to me in Jaffa, in 1884, where the black bees were tested for several years. John Hewitt, an English beekeeper, visited Tunis also, and gave the bees a new name, more appropriate for his sale, calling them Punics. Others called them Niggers. In 1889 my brother and I moved from Palestine to Algeria, establishing extensive apiaries to the east of Algiers.

We called them Algerians, or Kabyles, on account of the province of Kabylia, where we first obtained the bees. I took some fifty colonies of these bees to Nice in 1892, and thoroughly tested their qualities in the Alps during several years. Brown bees abound all over the French and Italian Riviera, and so in course of time all Algerian blood was bred out till no trace of such blood remained. They were also exported to Europe and America about the years stated above, by my brother and myself, and finally abandoned because of some undesirable characteristics, among which may be mentioned, first, their stinging propensities, which are very much the same as other Oriental races; and, second, their exaggerated mania for sticking bee-glue everywhere, as further noted below.

I have seen this race in Malta, in Tunis, in Algeria, and all over Morocco. They are also distributed in Tripoli, so a general name should be given them. In all of North Africa they inhabit the agricultural region known to the Romans as Tellorum, from which the Arabs derived the name *Tell*. The name of Tellians, therefore, is the most appropriate. The ancient Numidians, who inhabited North Africa, were called Barbarians by the Greeks and Romans, and all non-Arabian tribes living in the country are now known as Berbers. How long they have kept bees is not easy to decide; but Herodotus, the Greek historian, accuses them of adulterating the honey they put on the markets for sale. That eminent historian does not say whether those early beekeepers used grape juice, date juice, or sugar-cane; but they did not produce honey enough from their bees to meet the wants of the population. Very much the same can be said now. Honey is imported from France by Moslems, as they have lived on the "dry" system for the last twelve centuries, and are great honey-consumers.

Style of Hives Used by Berbers and Arabs

The Numidians very likely kept their bees in much the same style as the modern Berbers and Arabs do—laying down their elongated hives side by side on the ground, and covering them with a thick layer of alfa grass, which is found all over North Africa. In bigger centers regular hive-makers prepare two kinds of hives—one simply made out of the peeled bark of cork oaks, and formed into a tube, differing in width according to the bark which came under their observation, measuring 5 to 10 inches across the tube.

The second style of hives, requiring more skill to make, has a long square shape, and is made of fennel stalks, often over an inch in diameter. The stems of this beautiful fennel are gathered in the autumn, when the foliage and flowering are completely dry. They often attain 6 to 10 feet in height. Bits of 6 to 10 inches are cut up and perfectly peeled, which gives them a very clean and white appearance. The bits are assembled together by means of thin branches of willows at the top and bottom till there are enough to have planks of a yard or over in length. Four such stem-boards are assembled to form the walls of the hives. Cow dung and clay are mixed and smeared over the hives to exclude moths and other intruders. Both ends of the hives are closed by a square stopper made of the bark of cork oaks, and flight-holes are cut into the bottom of the stoppers.

In the swarming season, empty hives which have contained bees in previous seasons are laid out along the dry riverbeds, and a bundle of straw stuck up to indicate that the hives are owned by some one. Stray swarms usually fill the empty hives. The easy way in which swarms may be had has made the beekeepers very indifferent as to securing swarms in North Africa. Being questioned as to the uncertainty of having his own swarms, an Arab beekeeper, of the mountainous region of Oran, said: "Certainly my swarms may go off and settle in my neighbor's hives; but his swarms also may go off and settle in my hives; and thus every one has his share of swarms"—a very judicial way of settling disputes among those philosophers!

A Primitive Queen-Cage

To avoid vagrant swarms flying away, the Berber, long ago knowing of the existence of the *sultana*, or queen, invented a queen-cage cut out of a reed, and stopped on one side with a bit of wax. Two or three cuttings into the reed assure sufficient ventilation to the queen. This Tellian queen-cage is fixed in the center of the hive by blades of alfa passed through an opening in the fennel stems. The bees, after a few days, liberate the queen, when they will have begun building comb.

Honey is taken out only in autumn, and, according to beekeeping principles, the beemaster stops cutting out the honeycombs when he sees the brood. Honey stored about the brood, or in the other end of the hive, is considered enough for the bees to winter on safely. There are certainly indiscriminate beekeepers among the Arabs, but the same is to be said all the world over.

The great Moslem legislator, Mohammed, very wisely describes the bee as a direct gift to humanity, and has entitled one of the chapters of the Koran "The Bee," or "en Nahle." He says: "Your Creator has endowed you with the bee.

She builds her own dwelling-place from material taken from trees and bushes. She produces a healthy liquid of divers colors for the use of mankind. She is well set up as a case of meditation for the wise."

As such the bee is inviolable, and every mismanagement of the bee brings evil on the owner. Some Moslem theologians maintain that bees have a place assigned to them in paradise. This same black bee of North Africa is also found beyond the desolate belt of the Saharian desert, along Nigeria, Congo, South Abyssinia, the great lakes of Nyanza, Anganyika, down to Mozambique—in fact, meets here and there with the yellow African or Adanson bee, of which more will be said later on.

Physical Characteristics and Behavior

Queens, bees, and drones of this species are completely black when deprived of the brownish-yellow fuzz which grows about their bodies in their youth. The crescent at the base of the thorax is jet black. Maeterlinck, to whom this feature of the dark crescent was reported, in a humorous tone said, "I'm sure this is a trick of Mohammed."

Like all other Orientals they are vigorous defenders of their hives, and will attack the imprudent beekeeper who has no smoker ready and one who forgets to blow a good puff of smoke on them just before they are roused up will certainly remember his negligence.

The sense of smell is well developed, not only in the Tellian species but in all Oriental bees, on account of frequent dearth which occurs in Mediterranean regions, which cause also has developed their inclination to rob.

The Tellians are first-rate honey-gatherers but are not good comb-honey builders, as they are usually in a hurry to seal the cells and stick the cappings against the honey, which gives the combs a grayish color.

Their propensity to propolize everything—hive interiors, entrance, frames, and combs—is a disagreeable feature. But it must be remembered that they developed that art in the swamps of central Africa, where they originated, before man utilized them. Those myriads of insects, wasps, flies, hornets, moths, and reptiles would long ago have exterminated the bees, in search of the honey stored up, had it not been for the bee-glue which the bees could find all over the resinous stems of trees or plants.

A swarm of those bees which had taken possession of the hollow trunk of a palm tree in a garden in the town of Oran, Algeria, had glued over every approach to the flight-hole. Bee-glue was lavishly smeared about to a length of over a foot on either side of the entrance, and to a breadth of three to four inches. No doubt this was a protection against the above-named enemies.

Put into a good-sized hive, the Tellians lose their inclination to swarm in a relatively short time. They will raise queen-cells by the score, but not quite as many as do the Egyptians or Palestinians. Honey gathered by any race does not depend on the bees but on the bee pasture in reach of them. Tellians have proved, so far as extracted honey is concerned, as good storers as any, and honey is not influenced by the bees so far as aromatic flavor is concerned. The Tellians form a winter cluster satisfactorily in the Alps without any marked difference in this respect from European bees. The Djurjura mountain range in Kabylie is as elevated as some of the Alpine ranges.

No bees are really immune to any kind of disease. Foul brood of both the American and European type has been found to infect all the above species in countries where the diseases exist. With *Bacillus larvae*, or American foul brood, up to this time, infected combs have always been known to reproduce the disease, even when the combs had been discarded for one or more years. With *Bacillus pluton* every one of the races of bees could fight it, provided the queen was stopped laying for a week or ten days. Young bees in great numbers in combs infected with European foul brood will always be welcome, and will pull a colony through in the course of the season.

Geographical Distribution

The Tellians are found all over North Africa, from the Atlantic Ocean through Morocco, Algeria, Tunis, and Tripoli, but do not pass the northern slope of the Atlas Mountains. In some regions of Algeria, as the Aures Range, south of the town of Constantine, there are traces of former progressive beekeeping which may be ante-Islamic. They have, in contrast with the flat Kabelian or Berber hive, a bell-shaped hive standing upright, reminding one of the ancient Greco-Roman straw skeps. In early days of Arabic settlements in Spain, about Cordova and Seville, in the twelfth century, a treatise on beekeeping had been written describing this hive. It is made to some extent after the style of French straw skeps, prepared with the very resistant alfa blades of grass (*Stipa tenacissima*). The Kaybles have also a pan smoker of great antiquity.

A broad belt of steppes or high plateaus, covered with alfa and some other grasses, seperates the Tell region from the foot of the Atlas range in Algeria. This alfa region is about 150 to 200 miles in breadth, and nearly 700 miles in length. Only Bedouins inhabit the re-

gion, living in their tents and raising a considerable number of camels and sheep —the only animals which can thrive in this elevated and waterless region. These steppes form an absolute barrier to bees, which explains why Tellians and Saharian bees have not been mingled, as is the case in other parts of Africa.

COLONY POPULATION and HONEY CROPS

By W. J. Nolan

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Calculating the Number of Field Workers in a Colony Month by Month
Part II

A curve (Fig. 1) representing by weeks the population of worker-bees in the colony being described, so far as it was composed of bees emerging during 1922 only, shows a very rapid increase until the maximum, nearly 63,000, was reached during the period of the main honey flow. This high level was maintained about two weeks longer. Owing to the normal seasonal decrease in brood-rearing activity occurring in this locality, the population then slowly diminished until at the end of August it had dropped to about one-half of its highest level for the season. It then increased slightly and held its own for a considerable time. The curve brings out these changes quite clearly. The course of the curve until the very close of the active season can not be represented, because it is not known at just what point the bees emerged which were to winter over. At such a point, of course, the six weeks' average will not operate. Because of this fact the actual population during the latter part of September, and more especially in October, may have included bees which did not come under the six weeks' average, and which, therefore, are not shown by the curve. Nevertheless, if bees were living at that time which were older than six weeks they could not have been relied upon to survive the winter.

Since bees usually devote at least the last three weeks of their lives principally to gathering nectar, the number of bees of nectar-gathering age in this colony on the dates given in the following table has easily been calculated. These numbers would, of course, be a little too low if bees in this colony gathered nectar for longer than three weeks.

Bees of Nectar-Gathering Age

April 30	10,518
May 20	22,685
May 31	30,509
June 14	32,807
June 30	30,199
July 31	24,269
August 31	15,784
September 20	15,262
September 30	17,105

In this table the dates May 20 and September 20 are of special significance because in this locality the main honey flow may be expected to be on in full force by May 20, while any fall nectar flow should be on by September 20. The work done by these nectar gatherers will be discussed later. It is to be noted that at the end of June the force of field bees was still high. This would have been especially disastrous for surplus already in the hive had not sufficient honey-dew been available in the field during June for their maintenance until the summer decline in brood-rearing reduced their numbers. Increased brood-rearing activity during the fall came too late to prove of much value in providing additional field bees for the fall nectar flow.

The colony exhibited no signs of a swarming impulse during the season. Brood-rearing apparently experienced no sufficient check at the proper time before the honey flow to result in such an excess of newly emerged bees during it as to cause a swarm-inducing congestion within the hive. Likewise the number of field bees at any time when brood-rearing was most active never reached such an excess beyond those needed for field work as to cause a harmful congestion within the hive. This was true not only of the main honey flow but also of the honey-dew yield which followed. The annual seasonal decline in brood-rearing, which then ensued, eliminated the possibility that the excess field force might still become such a great hindrance to the nurse bees by hanging around the hive as to cause a swarm-inducing congestion.

The Effective Egg-Laying Rate

Some enlightening facts are brought out by studying the weekly rates at which the worker eggs were laid which eventually developed into adults. The egg-laying rate which represents only those eggs resulting finally in additions to a colony's population may be termed the effective egg-laying rate in distinction from the actual egg-laying rate which includes all the eggs laid. This rate for any day or period, of course, is identical with the rate of emergence for the corresponding day or period three weeks later. Of all the stages from egg to actual emergence, sealed brood has by far

the lowest rate of mortality. Hence, from counts of sealed brood the effective egg-laying rate may be quite closely determined, and a curve based on calculations of this nature is presented here (Fig. 1). It should be stated in this connection that throughout both 1922 and the previous year this colony had, entirely through its own efforts, more than sufficient stores available at all times.

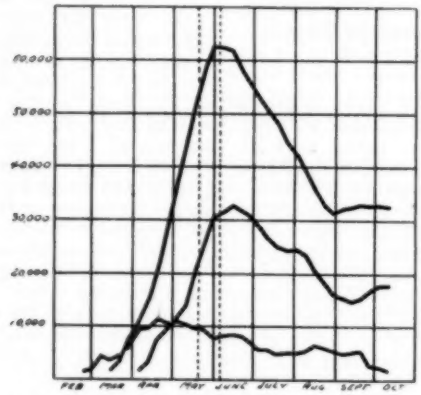


Fig. 1.—Total of worker-bees in colony discussed shown by curve with highest peak; nectar-gatherers by curve with next highest peak; and weekly effective egg-laying rate by curve with lowest peak. Vertical divisions represent units of 10,000 each; horizontal divisions represent months from February to October inclusive, except that the broken lines represent the extreme limits of the main honey flow at Somerset, Md.

Brood-rearing began very early in 1922, late February and early March having been exceptionally warm in this vicinity. Some unfavorable weather followed, however, which is reflected in the effective egg-laying curve. This curve for the end of March shows an increase due to better weather. In the middle of April considerable early nectar was available, so that, when the first super was added on April 14 to the two hive-bodies in which the colony had wintered, the brood-nest had become somewhat crowded in spite of precautions to provide plenty of room. This is seen by the fact that the weekly effective egg-laying total remained at nearly the same level for two successive weeks. It then mounted to its maximum, but was again checked by incoming nectar from fruit bloom. Nevertheless, during the next three weeks it still remained within a range of ten per cent of the season's maximum. Incoming nectar, and finally the main nectar flow, gave a definite check. The honey-dew in the middle of June served to stimulate brood-rearing for a short time, but the trend was downward until a certain level was reached which was maintained until egg-laying was stimulated again by the pollen yield in August. This was only short-lived, and even the nectar flow in September had no great effect.

When the Peak of Brood-Rearing Should Occur

It is quite apparent that in this region, in order to have the maximum field force on hand for the main honey flow, the maximum egg-laying must come during April. The earlier in April this occurs the better, if a worker-bee requires six weeks from the laying of the egg for hatching, passing through the larval and pupal stages and through a three weeks' cycle of hive-duties before becoming available for the field. If, then, in this and similar regions, the maximum brood-rearing activity must come before the end of April, but little time is allowed for preparation in the short month of March in comparison with the time available in localities where the nectar flow comes much later in relation to the beginning of the active season. Fall management, therefore, becomes doubly important in such cases.

How often a honey crop beyond the average has been accounted for by stating that the population of the colony which produced it must have arisen from some unusual egg-laying rate. In Gleanings for July, 1924, in an article on the egg-laying rate of the queen-bee, the author made the statement that "from the scientific data available up to the present time it would even seem that a daily egg-laying rate of 2000 continued for any length of time may be taken to represent the performance of a queen-bee beyond the average." When we calculate the gain in sealed worker-brood per week from the weekly counts of sealed brood in the colony here under discussion, on no occasion do we find a weekly addition representing a daily egg-laying average of more than 1610 during any week. The highest average for the 12-day period represented by each count of sealed brood amounts to 1550. This colony, nevertheless, before the main honey flow was over, filled three ten-frame Langstroth hive-bodies completely with brood, pollen, and nectar, as well as storing so much nectar in two additional ten-frame Langstroth hive-bodies as to necessitate putting on still another to provide sufficient room within the hive. Ten frames of foundation were drawn out during the main honey flow. At the beginning of the honey flow the colony had some 20,000 bees of nectar-gathering age, and at its close some 30,000. The highest number during the season was 32,807.

What 20,000 Nectar-Gatherers Can Do

Let us see how much a continued force of only 20,000 nectar-gatherers can really do in a honey flow lasting several weeks.

This involves knowing the average load of nectar carried in by each worker-bee as well as the average number of trips per day. According to Park of Illinois, and Gillette of Colorado, the average nectar load is one-half of the weight of the worker's own body. According to Koons of Connecticut and Lazenby of Ohio, this figure is about one-quarter of the worker's own weight. Park found the maximum load to be 85 per cent of the bee's own weight, while Lazenby found it to be in excess of one-half. Demuth found the worker capable of carrying its own weight in honey when robbing. The use of one-third in this connection is, therefore, strictly conservative.

It now remains to settle on the number of trips per day. According to work published by Park, this varies greatly with the season. In 1920 and 1921 he found a maximum of 24 and 17 trips daily, respectively, while the average number of trips per day in each year was 13½ and 7. Furthermore, in 1920 he found the average daily number of hours of field work to be 8½ as against 7½ in 1921. It is again conservative to adopt 9 trips per day, or about one trip per hour, for the purpose of our calculations. We may assume favorable conditions; for who ever heard of a bumper crop under unfavorable conditions?

Assuming further that there are 5000 bees to the pound, 20,000 bees making 9 trips per day would bring in 12 pounds of nectar daily as a very conservative estimate. If this continued for five weeks there would be carried in 420 pounds of nectar, which, if it contained 75 per cent of water and was evaporated to honey containing only 20 per cent of water, would give 131 pounds of honey. If the maximum force of approximately 33,000 nectar-gatherers in our colony could have had full activity during five weeks, under the same assumption they would have carried in 693 pounds of nectar, or about 216 pounds of honey.

It should be borne in mind that Park and others found one-half to be the average load carried by the worker-bee instead of only one-third, the figure used in the preceding calculations. If one-half is used as the basis of calculations the results just given must be increased 50 per cent, making 196 pounds and 324 pounds of actual honey the results of the labors for five weeks of a force of 20,000 and 33,000 bees respectively.

If a queen maintained such a daily egg-laying average as to give an average daily emergence of 2000 new worker-bees for six weeks, there would result a total population of 84,000 workers, which would include 42,000 bees of nectar-gathering age. If each of these nectar-gatherers made only three trips daily and returned each time with a load of nectar equal to one-third of its body-weight, the whole 42,000 bees would bring 8.4 pounds of nectar per day. With 9 trips per day, 25.2 pounds of nectar would be brought in. It is hard to conjecture the possibilities of such a colony if it continued at this strength in the center of a sweet-clover region under favorable conditions.

As stated earlier, Park in 1920 found the maximum number of trips for nectar to be 24 per day, and the average number to be 13½. According to these data it would be conservative for purposes of calculation to use 12 as the average number of trips per day, assuming a favorable season. If, in addition, the average load of nectar is calculated as being equal to one-half the body-weight of the worker bee, as found by Park and others, a colony with 42,000 nectar-gatherers would carry in 50.4 pounds of nectar in one day. Such a rate would mean 1764 pounds in five weeks, which, on the same basis of evaporation as used earlier in this article, would yield 551 pounds of actual honey. An average of even half this would suit most beekeepers at present.

Some Staggering Figures

If any such an emergence rate as 4000 worker-bees per day were attained for three weeks or more, the figures just given would be doubled. Consequently the resulting force of 84,000 nectar-gatherers, if continued, would be capable of bringing in during five weeks a ton and three-quarters of nectar, or, to be exact, 3528 pounds. This, when evaporated to honey, would be reduced to 1102 pounds. Even allowing for honey which might reasonably be supposed to be used for brood-rearing and colony maintenance during this period, if any such crop has ever been obtained in only five weeks it has apparently not received the recognition it deserved.

The percentage used here for the water content of nectar is in line with the results of the leading workers in this field. Bonnier, for instance, states in his well-known work of 1878 on nectar secretion that the amount of water, disregarding hot dry weather, can be said to vary between 65 per cent and 85 per cent in most cases. The average of these numbers is 75 per cent. Von Planta, in his celebrated article of 1886 on the chemical composition of various kinds of nectar, gives the water content as varying between 59 and 93 per cent. Their average, 76 per cent, is almost identical with that of Bonnier's data. In 1924 Brünnich expressed the opinion in the Zeitschrift für Angewandte Entomologie that

the average water content of nectar may be considered as 70 per cent.

Recent investigations, however, indicate that nectar, when first carried into the hive by the bees, contains a much smaller percentage of water than the averages just quoted for nectar still in the flowers. Thus, Hambleton, according to Bulletin No. 1339 of the United States Department of Agriculture, has found the total amount of evaporation within the hive during certain honey flows to be as low as 25 per cent. To suffer a loss of only 25 per cent of its water content during the course of evaporation to honey containing 20 per cent of water, any nectar would contain no more than 40 per cent of water when the process began. Brünnich, as a matter of fact, reported in his article already cited that during a certain investigation he had found approximately only 40 per cent of water in nectar on the very day it had been first brought into the hive. If, then, the amount of evaporation is really much less within the hive than has been commonly supposed, whether this be due to an elimination of part of the water content of nectar by the bees on their way back from the field, as advocated by Brünnich, or whether due to any other causes, the figures given in this article for honey derived from the nectar carried in by the field bees must be doubled or more.

Disregarding the question of the evaporation of nectar, however, the performance of the colony discussed here, and the knowledge available at the present time as to lengths of honey flows, number of nectar trips per day, and relation of nectar loads to the body weight of the worker-bee, point to the fact that a queen-bee which will lay 2000 eggs per day for several weeks at the proper time can produce a colony population with a field force large enough to gather a crop satisfactory to the beekeeper of the present day. Furthermore, regardless of what is done by breeding, or otherwise, to improve any individual factor just mentioned, the most important factor of all in connection with obtaining a maximum honey crop will continue to be the time when and in what numbers new bees are added to a colony's population. In other words, to get a maximum honey crop the beekeeper must so time his colony's population as to have the season's maximum field force available during the main honey flow.

Washington, D. C.

GRAFTING LARVAE INTO CELL CUPS

By Allen Latham

Some Refinements in this Process that Result in a Greater Percentage of Accepted Cells

Many hesitate to undertake cell-grafting, thinking it a complicated operation requiring much skill and special tools. It is an operation requiring great care, and one greatly facilitated by the use of carefully prepared tools, but it is not one requiring much skill.

It is not necessary to buy tools, as excellent ones can be made with a keen knife from a piece of section. I have tried various materials to make grafting tools from, but find none better than wood. I dislike metals because of their tendency to rust or corrode. Goose quills are good, but very difficult to make and keep in perfect working condition. The quill transferrer is too stiff until softened in the mouth, and after a dozen or so of larvae have been transferred the quill has then become too limber for easy work.

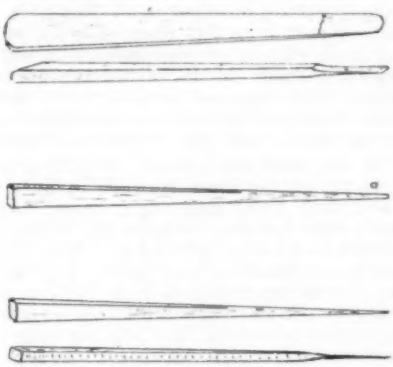
With a keen knife split a straight-grained piece of section into narrow strips. Trim one strip down so that the end is a scant quarter-inch wide, then shape this end into a thin paddle. Narrow another piece down to one-thirty-second of an inch and then thin it to an edge. Buff the last twentieth of an inch down to paper thinness and then trim the end very smooth. Whittle down a third piece to a round end about $\frac{1}{16}$" in diameter. Cut all three tools down to length most convenient to use, as experience dictates. These tools cost only a few minutes of time to make and are easy to replace at any time. The first one described is the paddle for stirring the royal jelly to the right consistency; the second is to transfer the larvae, and the third to stock the cups with jelly.

Provisioning Prepared Cells with Royal Jelly

One can graft dry cups, but it is difficult and, unless conditions are favorable, rather uncertain. With the aid of royal jelly the grafting is made much easier and much more certain. In my last article I told how the cups were given to the queenless colony. The frame of cups is now removed and each cell given a tiny drop of jelly by dipping the rounded stick into the supply of jelly and then touching the bottom of the cup with it. It is rather immaterial whether a tiny drop or ten times as much be put into the cup, provided it is jelly of fresh

quality and right consistency. As one can not always be certain of the consistency and quality, it is in the long run safer to use a tiny drop.

The best supply of jelly is obtained by robbing the colony last grafted, or one grafted two or three days earlier, of three or four partially completed cells. One will usually find the largest supply of jelly in cells where the larvae are between three and four days of age. Lacking such cells, one must fall back upon



Tools for transferring larvae, made from pieces of sections. Upper: two views of paddle for stirring royal jelly. Middle: stick rounded at one end for placing small drop of royal jelly into prepared cells. Lower: two views of transferring tool. Note the flexible end used to slide under the larvae.

the emergency cells of the dequeened colony. After carefully removing each larva with a sliver of wood, dip out the jelly with the paddle until a sufficient supply is obtained. I have a little cup which was made originally as a teacup for a doll's teaset. The jelly is put into this and pure water added and thoroughly stirred in until the jelly is like fairly heavy cream. One can err in having the jelly too thick rather than too thin. If too thick the grafted larva is bound to suffer, while if too thin the bees are very likely to refuse to accept the cell. I prefer to have the cell refused than to have one develop and yield a worthless queen.

Best Temperature for Grafting

As soon as the cups are stocked with jelly the bar of cups is covered with a damp cloth. This damp cloth is kept lying on the cups all the time except the time required to place the larvae on the jelly drops. There has been much warning thrown out regarding the care one must take that larvae do not get chilled. We are told to do our grafting in a warm room. Now it happened one day that some beekeepers were calling on me and the ladies were in the house preparing a meal. My wife barred us from the only warm room available, the kitchen. It was cloudy and a light rain was falling. All indoors was too dark for work except at a west window. "All right," said I, "we will graft anyway, and see what comes of it." The grafting was done right out in the open. The temperature was somewhere round 60°F. That batch of cells was accepted in a nearly 100% manner, and as fine a lot of lusty queens came from those cells as I ever wish to see. We live and learn. I do my grafting in the open now, hot or cold, unless it is so cold that I can not do such work outside with comfort. Feeling assured that drying out is a danger greater than chilling, damp cloths are kept about the cups all the time. Now every one knows that damp clothing is chilling. I know that damp cloths have proved a boon to me in my cell-grafting.

Selecting the Larvae for Transferring

With the cups all ready a comb is selected from the colony containing the queen-mother which has newly hatched and growing larvae. The most difficult part of grafting is the finding of larvae of a right age and condition. It is well to have two or three breeders from which to select, for it will frequently happen that one colony will not furnish what we wish, while another will. Queens have resting-spells, and if a resting-spell has occurred three or four days before the grafting is to be done there will be very few larvae of the right age.

So far as I can determine, it makes no difference in the quality of the queen resulting whether a larva is a few hours old or two days and a half old. The only difference, so far as I know, is that the one two or three hours old is very difficult to transfer successfully and will not emerge as a virgin queen until the thirteenth day, whereas the larva two days and over of age is easy to transfer and will emerge as a queen late on the tenth day or early on the 11th. Two days are thus gained in time. However, there seems to be a prejudice against larvae of that age, so let us compromise by selecting larvae one day and a half old if possible.

Should Larvae be Selected Before or After Moulting?

This whole matter of age and condition of larvae is one that our colleges should study exhaustively. By condition I refer to the time elapsing since the last moult or time to elapse before the next moult. I am not ready now to say whether it is better to select a larva just ready to moult or one that has just cast its skin. All insect larvae rest for a time at the moulting stage, taking no food. This resting and fasting time of the bee-larva is short—much shorter than with most insects. This can be noted by

looking over a frame of comb containing thousands of young larvae. Now, if the moulting stage lasted an hour or so one would see several hundred larvae in this quiescent stage. As a matter of fact, he will rarely see more than a dozen or so. I recall one time when a comb had several score of larvae just resting previous to the second moult. I used these larvae to graft with and had a wonderfully fine lot of cells result, and the virgins ran larger than the average. As laying queens I could not see that they had any superiority. Unfortunately the mother queen was not a good breeder and I never got good queens from her, so my experiment did not come to anything.

Mr. Doolittle,* who was as successful a queen-rearer as this country has ever had, preferred larvae just after they had cast their first larval skin. If we consider this matter briefly we will see that conditions for success are vastly different if, on the one hand, we select a larva just previous to its moult, or, on the other hand, select one just following its moult. In the first case the transferred larva will not eat for a brief time and the nurse-bees will be tucking food about it just as soon as it is ready to eat. In the second case the larva is transferred at a time when its appetite is prodigious. If the jelly upon which it is placed is all right then this hungry larva will thrive; but, supposing this jelly is not quite right, then the hungry larva will either continue hungry for a time or else fill up with food which may do it serious harm. We hesitate to chill larvae, but many of us do not hesitate to starve them for a time. Is this not wrong? The chilled larva is simply made quiescent and will at once begin to eat normally as soon as its temperature becomes right again, but the starved larva has an interruption of cell growth that can never be recovered. A little loss of time in this case matters slightly, while the little loss of growth may mean the difference between an excellent queen and an average queen, or between an average queen and a worthless queen.

The stocked cups, since they are covered with a damp cloth, have not been hurt by this digression and we will proceed to graft the larvae.

Lifting Larvae with Transferring Tool

The grafting-stick has been carried for some minutes in the mouth and the tip is now very pliant. With a knife blade a row of cells containing young larvae is slit and the side walls on one side pressed away. The exposed larvae now show up clearly and we can select the proper ones and then slit the next row of cells. The grafting-stick is thrust straight down to the bottom of the cell. Its pliant end bends and follows the cell bottom and thus runs under the bedded larva. The larva and most of its surrounding food is lifted out. The stick is then thrust into the drop of jelly in a cup and with a reverse motion is withdrawn, leaving the larva floating on the jelly. This does not require much skill, and if proper larvae are available one can graft 50 cups in a very few minutes.

If one does not succeed in lifting out a larva at the first trial it is well to leave that larva and begin anew. Any larva that has been overturned is almost certain to be rejected, and any larva that has been disturbed and partly buried in jelly is too uncertain to risk. If one expects to get 100 per cent of his cups accepted he must use this 100 per cent of caution. It stands to reason that if a manipulator treats all the cups just alike and avoids all abnormalities he is no more likely to have one cell discarded by the bees than another. If bees accept 17 out of 20 cells it means that they reject 3 out of 20 cells. Why do they reject them?

As soon as the cups are all grafted the frame is replaced in the hive. For half an hour or so these bees have been hopelessly without a queen. There are thousands of nurse-bees fairly aching to feed larvae. When the frame is pushed into place these bees smell the royal jelly and at once set up a joyous march toward that frame. If the beekeeper sees thousands of bees with upturned tails facing that frame, he need have little fear that those cups will lack care.

The length of this article, like Topsy, has seemed to grow, and space will not permit the treatment of the developing cell. This will be the topic in the fifth article of this series.

Norwichtown, Conn.

[*The following extract from "Scientific Queen-Rearing" sets forth the views held by Doolittle as to the proper age of the larvae: "I also claim that the food fed to all larvae, up to the time they are thirty-six hours old, is exactly the same, whether the larvae are designed for drones, queens, or workers; and that the difference comes by the queen-larva being fed large quantities of this food, all of its larval life, while the others are fed sparingly later on, or else a different kind of food given after they are thirty-six hours old. Some experiments which I have conducted point in this direction, but as yet I have not completed them fully enough to warrant the giving of them here. If the above is correct (and I firmly believe that it is) it will be seen that the larva in a worker-cell has all of its wants supplied for the first day and a half, and is developing towards a queen just as fast, prior to this, in a worker-cell, as it possibly could in a queen-cell, surrounded by ten times the food that it can consume. Hundreds of experiments in using larvae from three hours old, up to those of thirty-six hours, prove that queens from the former are in no way superior to those from the latter, while the bees always choose the latter, where the power of choice is left to them."—Editor.]

FROM THE FIELD OF EXPERIENCE

METHODS OF INTRODUCING QUEENS

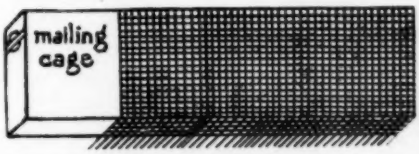
A Push-in-Comb Cage Combined with the Ordinary Mailing Cage

I have lost but very few queens when using the ordinary cages in which queens have been received by mail, but instead of entirely removing the card tacked over the candy, as some recommend, or leaving the entire card as others advise, I have found it best to take a sharp knife and cut away enough of the card on each side so that only a narrow strip remains, covering only the center third of the hole leading to the candy. In this way the bees are allowed to see and smell and sometimes they can even taste the candy, which starts them to gnawing at the remaining strip of card and better insures the release of the queen, while still retarding that event sufficiently to make her reception more likely. If the card is entirely removed at the start the bees may eat their way through too quickly and kill the queen, while if the entire card is left they sometimes will not attempt to eat through at all and the queen will not be released as expected.

I have also had excellent results from the use of the "push-in cage" when switching or introducing queens from one hive to another. I have discovered that proper candy for use in cages is not easily made and without it the candy cage is of little use, so I usually contrive if possible to put a "push-in cage" over the queen in such a way that she will have a few cells of honey and some empty cells or brood under the wire with her. If some of her bees are with her, no matter. The frame may then be placed in any hive and the bees will usually manage to gnaw under the wires and release her without further help.

I have found this a very convenient and safe way to introduce "home-made" queens, but in Gleanings for September, 1923, on page 579, C. B. Gooderman described a way to combine the good qualities of the candy cage with those of the push-in cage which I think is excellent for introducing queens received by mail. I wish, however, to offer a suggestion which I think improves and simplifies his method. Instead of bothering to make a cage requiring candy and that the queen be transferred to it from the mailing cage, simply make a push-in cage of ordinary fly-screen wire (galvanized) the exact width of the mailing cage, leaving one end open as shown in the figure. Then slip the mailing cage into the open end of the wire cage about half the length of the former, leaving the candied end out. Fasten them together with a tack driven into each side or by tying a cord or piece of light wire around them.

Now remove the small screen that was tacked over the entrance to mailing cage when the queen was caged, so that the queen can run out under the wire, push the ends of wires into the comb over some empty cells or brood, also a few cells of honey if possible. If the wire side of the mailing cage is turned down the queen will run out under the push-in part sooner, and if she has empty cells she will probably lay in them and so better insure her being accepted by the bees. The cage is already supplied with candy.



A push-in-comb cage with one end open to take the regular mailing cage.

The card over the candy should be cut to one-third the width of the hole as mentioned earlier in this article. I prefer making the push-in cage seven inches long, as that gives the queen more room to lay and get acquainted. The bees can either gnaw under the wires or through the candy to release her.

And now for the last resort. Several times I have had great trouble getting colonies requeened. After they had killed queens and torn up queen-cells, simply refusing to accept anything I gave them, I have daubed a queen heavily with honey, put her in the hive and had her accepted without further trouble.

Last fall I opened a hive to ascertain how a queen had fared which I had introduced about a week earlier. The bees balled her at once. I rescued her but she fell back into the hive and they went at her worse than before if possible. When I got them off of her again I dropped a big daub of heavy honey on top of her and put her back into the hive. They licked her off and all went fine from that time to this. I have never had a failure when using honey, but lost two queens when I tried it with sugar syrup. Plenty of sticky honey will do it and there seems to be no danger of smothering the queen, as some have feared.

Alpine, Calif. J. B. Stuyvesant.

INVENTOR OF HONEY-EXTRACTOR

Some Side Lights on Major von Hruschka and His Great Invention

Except the invention of the movable frame by Dr. Dzierzon in Germany, and Langstroth in America, no other invention has been so important in its results for beekeepers as that of the honey-extractor. It was the wish of Major von Hruschka's father that the boy should engage in the manufacture of war material. He was the son of an officer in the Austrian army, and was, at the time this invention was made, the commander of

Major von Hruschka, inventor of the honey-extractor.

a garrison in a small Italian city in Legnano near Venice, but which, up to the year 1866, belonged to Austria.

The invention of the extractor was the result of an accident for which we should be thankful; and this has been the case with all great inventions.

Major von Hruschka was a beekeeper, having in Legnano a fine apiary, and was a devoted friend of the bees. One day his wife desired to get a piece of honey, and sent her little son to his father, who then was in the apiary. She gave him a little basket in which was a plate. Hruschka then cut out a piece of freshly made honey which was still uncapped. He laid this in the basket. When the boy found himself followed by the bees he swung the basket around his head. On account of the circular motion of the basket the honey on the plate began to run out. Observing this led the thinking man to the construction of the honey-extractor, which today is indispensable to the beekeeper.

Hruschka then built a small hand-driven extractor, and with this he emptied the honey from the cells at the great European bee conventions in the year 1865, one of which took place in the city of Bruenn, Germany. The assembled beekeepers were all thoroughly convinced that here was a great invention and that it would no more be necessary to tear the combs to pieces to secure the honey.

At this convention Major Hruschka was as much honored as if he had been a hero in the war. The presiding officer, Mr. Nakh, embraced and kissed the fortunate inventor, and the enthusiasm of the assembly could hardly be restrained.

The first large honey-extractor that Hruschka had was driven by a steam-engine such as is used to drive our thrashing-machines. Soon other methods of propulsion were applied.

All the beekeepers of the world owe their thanks to the inventor of the honey-extractor, and hold his memory in reverence. Hruschka died in 1888; but his invention will endure as long as there are bees and beekeepers.

Milwaukee, Wis. Louis Alfonsus.

A QUEEN-INTRODUCTION SCHEME

Another Push-in-Comb Cage. Suggested Improvement for the Jay Smith Cage

Editor Demuth tells us that he has been able to get successfully introduced a majority of young queens which are mated in a "set-off" upper story, by simply placing this upper story back on the hive with a newspaper between, when the comb-honey supers are removed, without looking up and removing the old queen.

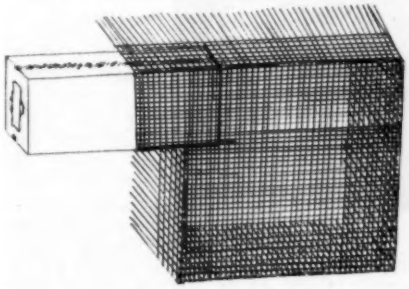
Those who are operating a large number of colonies, or those who are trying to operate a smaller number with the minimum amount of time, have often wished for a plan whereby a young queen could be flipped into the entrance of a hive without removing the old queen, and have a high percentage accepted.

Many have been the devices constructed for introducing queens. Very often a new device is pronounced perfect by the inventor the first year it is used. Usually the phrase "one-hundred-per-cent perfect" is not used after the first season. Some of these devices are comparatively simple; others, while not exactly complicated in themselves, require a great amount of time for their operation. Since time is one of the great items of expense in honey production, speeding up a neces-

sary operation should result in reducing the production cost.

Ever since the Jay Smith cage has been before the beekeeping public I have had a feeling that the principles involved are sound, but that the three visits where outyards are operated at a distance make this cage impractical. It is more profitable to lose a certain percentage of queens by using a one-visit cage than to have 100 per cent introduction by using a three-visit cage. Consequently a friend and I sat up until the "wee sma' hours" one night and perfected (?) the cage.

Our plan is to make a "push-in-comb" cage of heavier wire cloth, eight meshes to the inch, four inches wide, and five inches long. One corner of a narrow end is cut so that the ordinary mailing cage can be held tight under the wire-cloth cage when it is pushed into the comb.



Mr. Carr's idea of a push-in-comb cage combined with the regular mailing cage for automatically releasing the queen.

The candy end of the mailing cage is outside the wire cage. In practice this cage is to be placed on the comb as recommended in using the usual push-in-comb cage, and at the same time the filling end of the Benton cage is to be opened so the queen and her attendants can emerge into the space under the wire-cloth cage at will. The queen will eventually fill the available cells with eggs. In due time the hive bees will work their way through the mailing cage and get acquainted with the imprisoned queen. Up to this point there seems to be no chance for failure. Theoretically, when the queen has filled all available cells with eggs, in searching for more she would find her way out of the small enclosure into the main part of the hive by way of the passageway through the Benton cage.

Opportunity to test this in the apiary has not as yet presented itself. Naturally the success of the operation hangs on the question, "Will the queen without fail find her way out?"

At the last convention of the New Jersey Beekeepers' Association Mr. S. E. Haviland showed a modification of the Jay Smith cage which appears to have all its advantages and reduces the number of visits to two. This is the usual push-in-comb cage with a half-inch hole cut in one end near the top corner. In front of this, inside the cage, is fastened a block of wood one and a half inches long, one inch wide and half an inch thick. This has a three-eighths-inch hole bored through it lengthwise and over the inner end of this hole is fastened a piece of queen-excluder zinc. The hole through the small block is filled with queen-cage candy. Since the hive bees can gain access to the queen after they have eaten out the candy plug, this reduces the visits necessary to operate this cage to two.

Pennington, N. J. E. G. Carr.

KINKS, NEW AND OLD

Some Hints on Selling Honey, Building Cellars, and Requeening

A good way to advertise honey is to get in touch with the membership of the women's home economics clubs. Honey leaflets, such as those published by the Roots, Dadants, and the American Honey Producers' League, are suitable for handing out to members. These clubs often welcome a talk on special subjects pertaining to foods and health. Teachers of home economics and the doctors should be furnished with the proper information concerning honey as a food.

Grocers often put comb honey in the ice box on the approach of warm weather. To avoid this we have a label printed in rather large type pasted on the back of each case of comb honey. It reads, "Don't keep honey in the cellar or ice box. Keep warm and dry."

Intermittent canvassing may dispose of some honey, but it is an expensive way of marketing if one's time is of value. Besides, after the honey is used up the consumer does not know where to get more, and consequently goes without honey until the next peddler comes along. Systematic advertising and a constant supply furnished to grocers throughout the year will dispose of our surplus at a minimum cost of distribution, and in maximum quantity. But there are drawbacks due to beekeepers themselves. If some plan could be worked out whereby beekeepers could be taught salesmanship and co-operation rather than competition, there would be more profit in the business. If a beeman, through advertising and good business practice, builds up a market in a given town or city, then beekeeper No. 2 is almost sure to come in and undersell the market. He usually will sell to the grocers at the grocer's own price, and then will proceed to sell to the grocer's customers at the same price. It is easy to imagine the result.

It seems that farmers and beekeepers are about the only people who have not yet learned to co-operate in a business way. Increased production will not solve our problem. We must learn to market our product.

In cellar wintering the size of the cellar should be proportioned to the number of colonies. If only a few hives, they are best wintered outside as they would not be able to keep up the proper temperature in a large cellar. On the other hand, too many colonies, in case of an open winter, might keep the temperature too high and the bees become restless. We find a cellar 16 feet by 20 feet about right for 100 to 125 hives.

Why do apicultural writers continue to say that a good way to requeen is to remove the queen and then give a ripe queen-cell? About the only time it will work is when weather or other conditions are unfavorable for swarming, or in case of a weak colony. A young laying queen may result finally, but she will not be a queen reared from the choice cell given, once in a hundred times, at least in this locality. Even nuclei often swarm out if a queen emerges in the presence of unsealed brood. E. S. Miller.

Valparaiso, Ind.

[Mr. Miller's location usually furnishes an early honey flow from clover and a later one from fall flowers, so that the swarming season is not as sharply defined as in many localities. This may explain the peculiarity he mentions in his last paragraph.—Editor.]

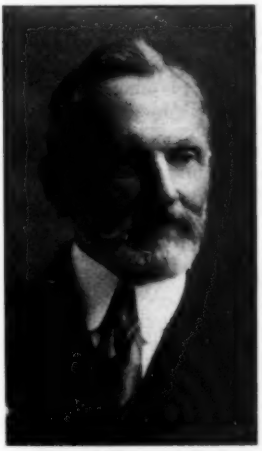
R. F. HOLTERMANN

The Passing of One of Canada's Most Extensive Honey-Producers

The death of R. F. Holtermann on June 10 marks the passing of a pioneer who achieved success in his chosen profession, and who, at the same time, cheerfully pointed the way to many others who followed. Never a strong man physically, Mr. Holtermann made a study of labor-saving devices, and strove constantly to improve his methods and equipment, so that beekeeping might be carried on on a larger scale with less physical effort. He was among the first to demonstrate the modern "out-apiary system." For years he advocated the four-hive winter case for outdoor wintering. He was continually on the alert for the best that others had to give, and was always ready himself to impart knowledge he had gained from his long, useful experience. Many of his students are now successful beekeepers on a commercial scale.

Mr. Holtermann was born in 1860, his parents emigrating from Germany to Canada in 1862. After attending first a private school and then a collegiate institute at Ottawa, he finally attended Ontario Agricultural College, from which institution he graduated with high honors.

It was in this institution as librarian that he received his inspiration to take up beekeeping, after reading the A B C and X Y Z of Bee Culture, and Cook's Manual of the Apiary. He spent the following season as a student with D. A. Jones.



R. F. Holtermann.

In 1887 Mr. Holtermann married a daughter of the late S. T. Pettit. There were four children, two daughters and two sons. The two sons have subsequently taken up beekeeping and both are also successful, as might be expected, both their father, and their grandfather on their mother's side, being pioneer beekeepers.

R. F. Holtermann served in many prominent positions connected with beekeeping. Always an enthusiastic man at conventions, he was popular as a speaker at meetings on both sides of the line. For years he edited The Canadian Bee Journal. He was also secretary of The North American Beekeepers' Association. This last spring he visited some of the western provinces, lecturing at the Manitoba Agricultural College and before some of the beekeepers' associations.

Mr. Holtermann was one of the earliest advocates of the large hive, adopting as his standard the twelve-frame hive, although in recent years he said more than once that if he were to start again he would use the ten-frame hive and the food-chamber. He was among the first to see the advantages of the power extractor, and he wanted his smokers big enough to last half a day with one filling.

R. F. Holtermann was a frequent contributor to the bee journals, especially during the early period of honey production on an extensive commercial scale, and did much to promote the idea of beekeeping as a business. The good that he has accomplished will live on.

H. H. Root.

SIFTINGS

by J. E. Crane

The experiment given on page 359 of raising up the food-chamber and placing under it above the brood-chamber a set of dark combs is exceedingly interesting in its preventing swarming. If it works as well elsewhere this method will prove of great value.

* * *

Morley Pettit's article on the production of comb honey in the June number of Gleanings is full of some of the discouragements of producing comb honey, and he didn't tell all of them either. He didn't even mention the vexation of having thousands of cull sections, or those too light to sell, some years.

* * *

What the Editor says on page 357 about dumping cull comb honey on the market is worth reading and practicing as well. We find such cull sections very useful to give colonies that are short of stores. Bees will clean up combs at this season that have become solid from granulation.

* * *

Phillip J. Baldensperger's account of Egyptian bees is intensely interesting. The fact that virgin queens will become fertile four or five weeks after emerging, as well as their method of rearing queens, would make it almost seem that Egyptian bees are a connecting link between *Apis mellifica* and some lower order of the genus Apis.

* * *

E. S. Miller says some good things (page 374) that are well worth remembering. One is that you can hive a swarm on foundation at once provided you place an empty brood-chamber under the chamber of foundation. Another is, "There is no work more profitable than frequent systematic examination of every colony through the summer season."

* * *

As usual Jay Smith has something to say (page 373) worth reading. Beekeepers have been looking for just such a candy as he describes for these many years, and all beekeepers are indebted to him for his patience in working out so intricate a problem. Let's see: One pound granulated sugar, one-half pound water, one-eighth teaspoonful tartaric acid; boil to a temperature of 248° F. and then work in as much pure pulverized sugar as possible. Thanks.

* * *

How fine it is that the good Lord has put it into the hearts of little birds to sing! I don't know whether it is because they have been fed so well during the winter in the Southland, or because they are so glad to get back to us, that they just bubble over with song.

* * *

Ira D. Bartlett tells some of his troubles on page 381, for whom I have a fellow feeling; but cheer up, my brother—there are lots of us in the same boat. I don't know how many frosty mornings we have had in May—lots of them, I am sure, and cold days, too. Besides, I never knew bees to be so short of stores. But as I look over the past sixty years I remember some of our best seasons have followed just such discouraging springs.

* * *

That diagram given on page 371, in E. R. Root's article, is almost startling in its clearness, illustrating a great national evil. Much as I abhor the alcohol habit, I have sometimes thought the dietetic habits of the American people are doing more to undermine the constitution and vigor of our race than alcohol has ever done. It is sad indeed to see children forming habits that will make them wellnigh worthless when they reach maturity.

* * *

Esau was condemned for selling his birthright, but he had a very good excuse for he thought he would starve if he did not get something to eat. It is the birthright of every child to grow up strong and vigorous. What folly to sell it for table delicacies and candy! May E. R. Root continue to "cry aloud and spare not."

* * *

Mr. Latham's article, page 362, is full of interest. He mentions the fact that the royal jelly does not spoil like milk. Is it immune to bacteria, or does it destroy these minute mischief-makers? Who can tell? Again he says for stimulating brood-rearing thin feed is to be preferred to thick. One part of sugar to two of water is about right, while one part of water to two parts of sugar is best for winter food. This is easy to remember.

* * *

"'The heavens declare the glory of God' and so does a drop of honey," says Dallas Lore Sharp; and I quite agree with him. I would add, so do the bees, the birds, the flowers, the fields and forests, and many other things; so let us keep our eyes and ears open at this season. It makes one glad and happy to think he can keep bees and live out of doors in the great world where everything is going on from bursting buds to falling leaves. I tell you it is just grand.

XUM

FROM NORTH, EAST, WEST AND SOUTH

In Southern California—Now that the crop is gathered we see no reason for changing our last month's estimate of the amount of orange honey produced in southern California this year. While here and there are beekeepers who report as much as forty or even fifty pounds per colony, many did not extract at all and the average is very low.

Most of the bees have been moved back on the summer ranges, which in most cases are very dry. Intermittent showers have fallen over most of these ranges during the past month, which should help considerably toward the bees' getting enough stores for winter.

As is always the case in a season like this, one will find too many beekeepers who give little or no attention to their bees. This, in my opinion, is one of the greatest objections to the "side-line" beekeeper. When every thing is rosy and honey is coming in he cares for his bees; but when prospects are poor he not only loses the light crop that he might have secured, but his apiary suffers great loss in numbers, in the destruction of combs, and from disease. It resolves itself into a case of "the survival of the fittest," and only the vigorous, thrifty ones pull through.

Undoubtedly the attraction of twenty-five cent honey and fifteen-dollar bees led many to get a conception of the industry that it will take several years to adjust to a normal condition. If I remember rightly it was W. Z. Hutchinson who said, "A fair way to value a colony of bees would be, count one dollar per colony for each cent per pound that honey is selling for." To this I would add, providing it is a full-crop year. With our orange honey selling at twelve cents it is no reason for bees being worth twelve dollars or even half of that amount. If an apiary produces one hundred pounds or even fifty pounds per colony each year of 12-cent honey, it might justify fixing values; but under present conditions it is hard to advise or even suggest to a prospective buyer what a colony of bees is worth in this country.

I understand that some buyers have offered 12 cents per pound for orange honey. Last year it sold at prices ranging from 10 to 15 cents. With the very short crop we see no reason why the prices should not be good again this year. The Beekeepers' Club advises that members should get fourteen cents for good orange honey. Just what is a fair price we do not know, but of this we are certain: the beekeeper needs all he can get for the little he may have produced.

I attended the great Shrine Centennial in Los Angeles June 3 and heard this saying repeated many times: "Oh, this weather is very unusual." It was raining and the Shriners were putting on all kinds of stunts from sailing a toy boat to fishing in the gutter. The next morning the paper said it was the fourth time in ten years that it had rained in June in Los Angeles.

Later.—I was looking over some of the bees located on the wild buckwheat today (June 6), and was agreeably surprised to see that they are getting some honey. The late showers, combined with the continued cool weather, has been ideal for getting all the nectar there is in the flowers. The bloom looks good and there may be a little honey yet from sage and wild buckwheat. While talking with a well-posted beekeeper recently we had no trouble in counting between thirty and forty carloads of bees that have been shipped out of southern California since the orange bloom. When one considers that perhaps that many more were moved around by truck he begins to get a faint idea of the extent of the industry down here.

Corona, Calif. L. L. Andrews.

* * *

In Utah—Conditions in Utah during April and May were nearly ideal for building up colonies. All plants that are a help to bees in springtime have yielded well, both pollen and new honey being so abundant that natural swarming began on April 27.

I always practice shook swarming in my comb-honey yards, so we got busy during the next ten days and out of 340 colonies shook 150, moving the brood to a new location. Most of these colonies now have young queens laying; and as our main honey flow comes from July 15 to Sept. 1, I expect about as good results from these as from those that have not swarmed.

Conditions were so favorable that many of the young shook swarms which had been given one comb of honey, three drawn combs, and the balance full sheets of foundation, had their hives full, with five to seven frames of brood in sixteen days, and were again building swarming cells. All such queens lost their heads and the colonies were given a ripe queen-cell so they will come along with the colonies all with young queens.

While Utah has had none of the freak weather of the East and middle west, we

are not out of the woods yet, for on June 1 one hundred miles northeast of us eight inches of snow fell, and here tonight, June 3, it is raining with the temperature at 45°. If it should clear off with wind in the north "Old Boreas" is likely to blast our hopes on the first crop of alfalfa, which is ready to cut ten days earlier than usual. It has been raining for two days. There is a saying here in the West that a dry year will scare you to death but a wet one will starve you. But we are trying to say with James Whitcomb Riley, "When God sorts out the weather and sends rain, w'y, rain's my choice." So far it has been a honey year. We have the bees and the plants, so we are hoping.

Hyrum, Utah. M. A. Gill.

* * *

In Minnesota—In my last letter I mentioned that Minnesota was having an ideal spring—warm, sunshiny, windless. The bees were carrying pollen on March 28. The result of these weather conditions was twofold. First, the bees bred up rapidly and consumed their available stores before the first of May. Second, they were building swarming-cells at that time. The beekeepers were patting themselves on their backs in anticipation of an extraordinary honey year, but now comes the sad part of the story.

May brought us a return of winter. It snowed, it froze, and there were heavy and killing frosts on thirteen days. It did not warm up until the 23d, and since that time we have had high winds, gales, storms, and tornadoes until the present writing, June 5. The bees had no chance at the fruit bloom or dandelions, nor at the white clover which is in full bloom at present. The result of this disastrous May weather was an absolute cessation of brood-rearing for lack of both honey and pollen. Feeding sugar syrup saved colonies from starvation, of course, but did not produce any brood. The result of the strong winds was a disastrous dwindling of colonies and June 1 found our bees weaker than they were on May 1.

The May Short Course at University Farm was attended by fifty beekeepers from all parts of the state.

By the provisions of the new law consolidating some 92 independent state bureaus into seven organized departments, the state bee inspection, so ably handled in the past by Chas. D. Blaker, becomes a section of the Department of Agriculture after June 30. Since Governor Christiansen is a good friend of the beekeeping industry, no serious changes in bee inspection are anticipated, either in personnel or appropriations, through their organization.

Some very important county and field meetings were held last month. One was in Redwood County, Redwood Falls, G. C. Matthews, of University Farm, attending. A county beekeepers' organization was the result of the meeting. Rev. M. F. Mommesen, of Belview, was elected secretary-treasurer. The Yellow Medicine County beekeepers organized with Dr. J. S. Kilbride, of Canby, as secretary-treasurer. The May field meet of the Hennepin county beekeepers was held at the beeyard of Mrs. K. Kercher, Brookside. It was well attended in spite of the bad weather. The wonderful lunch the ladies served made up for what the bad weather tried to spoil.

The tornado on June 3, covering the whole southern part of the state, which did immense damage to buildings and trees, also unroofed, upturned, and scattered thousands of colonies of bees. It is claimed by some that this shake-up may put a great deal of pep into the colonies affected. Let us hope it will.

After all has been said, sweet clover and basswood promise an abundant bloom. Since bees are known to recuperate fast, we hope to report some cheerful honey news in our next paper.

St. Paul, Minn. Francis Jager.

* * *

In Wisconsin—I have recently made a trip through Wisconsin, extending from the south border along the western part of the state clear to the north and back through the central counties. Everywhere I found our beekeepers optimistic and planning to increase the number of colonies of bees. The 1924 honey crop is so nearly gone that only two small salable lots remain.

The attitude toward the county associations and the state association is excellent, and there are strong indications that the membership in both the local and state associations will be considerably greater than last year. New interest is being developed in the use of standardized labels and containers, and the Rock County beekeepers are planning to pack all of their honey this year in five-pound Badger Brand lithographed pails to sell at a uniform price of $1.10 to $1.15.

Wisconsin beekeepers are rapidly developing standard prices for extracted honey, and we may expect in the near future to have a uniform price of $2.00 for the ten-pound pails and $1.05 to $1.15 for the five-pound pails. Standardization in price of comb honey is also gradually developing, but has not progressed as rapidly as is the case with extracted honey.

It is very difficult indeed to tell at this time what the crop conditions will be and also the strength of the bees. There

have been considerable losses, due to the fact that many of our beekeepers did not feed and many colonies ran on the verge of starvation for nearly a month. Instead of the colonies' building up, in many cases they actually decreased in number of bees. A few beekeepers who fed their bees experienced no difficulty from the cold spring, even though their bees were in windy places and unprotected. We must, therefore, come to the conclusion that reasonably good colonies of bees, starting out in the spring with plenty of stores, if given more as they need them, will build up in spite of weather conditions.

Had the weather been warm enough for the bees to get into the field, they would have had no difficulty in securing an ample supply of both pollen and nectar. I have never seen a year in Wisconsin when the early spring blossoms were as abundant as this year. In every section of the state dandelions bloomed in great abundance everywhere except in cultivated fields, and in some spots they were so plentiful that they appeared as a continuous field of yellow blossoms.

Winter losses continue to be the most serious problem of Wisconsin beekeepers. I believe that, if the actual figures could be secured, a 20 to 25 per cent actual loss in bees would have been shown for the past winter. But this has to some extent been overcome by the long spring, especially where bees had sufficient stores to build up.

The foul-brood situation has shown a wonderful improvement, and, due to the excellent work of Dr. Fracker, Mr. Adams, and their assistants, American foul-brood is being gradually reduced to a very low per cent.

One of the most important meetings this year in Wisconsin took place on May 28 at the G. B. Lewis Company's plant at Watertown. Something like 250 beekeepers were present to hear Dr. Phillips talk and to visit the plant of the Lewis Company. Fortunately, the day was very nice, being one of the few which we have had this spring.

Madison, Wis. H. F. Wilson.

* * *

In Oregon— Bees are working heavily at the present time on Hungarian vetch, which is proving to be a very heavy producer during May. This vetch yields at least ten times the nectar that ordinary spring or purple vetch yields, and is much more abundant this year than it has been in the past. Since aphids are becoming very serious this spring, due to an unusual amount of rain during May, it is probable that Hungarian vetch will be more popular another year, as it is far more resistant to aphids than the common vetch. The clover crop, however, will be decidedly short, as a very large per cent of clover was killed out during the past winter. The honey flow from the Hungarian vetch began about the second week of May.

American foul brood seems to have been particularly bad here in the valley this year.

The local retail market has been decidedly better during the last few weeks. As there is prospect of another light honey crop in California, the honey market should be strong during the coming year.

There seems to be an added interest in beekeeping in the Lower Columbia district. One apiary of about 140 colonies is being moved from Linn County to this district, also a like number from California. One beekeeper is also moving from the Willamette Valley to eastern Oregon. H. A. Scullen.

Corvallis, Ore.

* * *

In Iowa Iowa has been dry, as well as the surrounding states. Central Iowa has probably suffered most. Even Missouri, which is usually considered a wet state, has, according to reports, only two-thirds of her normal rainfall. Sunday, May 24, we had quite a fall of snow with lower temperature and several nights of frost doing considerable damage to crops and gardens. The following Sunday was very warm with high winds and things did not look a bit rosy. However, things have taken on a different aspect, as it rained Sunday night, and while I am writing this article we are having another fine shower, with good prospects for more, which will make the beekeepers smile. It was mighty hard before the rain for either the farmers or an optimistic beekeeper to feel the least bit optimistic, as it would not have been long until the honey crop would have been cut very short; and it is not too late for that yet, for these showers must continue to supply the needed moisture as the ground was so dry that it would take a lot of it.

The bees are in better condition this spring for strength than for some years. They had fine weather in April to get the benefit of all the flora, and brood-rearing went on at a good rate, with no setbacks from snowy cold weather such as we sometimes have at that time. In fact, April was better for bees than May, as May was below normal in temperature, while April averaged almost as high as May. Usually there is about 10 degrees difference.

In spite of the cool dry weather the alsike and white clover are in bloom and the bees are gathering nectar from it

quite freely. This is about 10 days earlier than common, and with these showers coming on it looks as though there would be no time for fishing. We fully expect swarming to be bad if the honey flow comes on well, as reports of swarms have come in ever since the first of May; and, the hives being so full of bees, it behooves the beekeepers to see that they have plenty of room as well as to make them comfortable, or we may expect plenty of swarms which require lots of manipulation.

I can well remember how enthusiastic (and, I will have to confess, how pleased) I was when I first commenced to keep bees when I saw a swarm issue, because I wanted increase and was so ignorant as to think that was the way to get it. Now there is nothing entrancing, as Dr. Miller used to say, in seeing a swarm whirling through the air. One thing he did enjoy was to see the seething mass hurry into the hive when dumped in front of it; but he did not want the distress of seeing them pouring out for the sake of this pleasure. I think all good beekeepers agree on this point, but I think the most of us get what he termed a few accidental swarms. I call these supersedure swarms, for after close observation for a number of years I am inclined to believe that the larger per cent of swarms coming off in May are supersedure swarms, and if every thing were as it should be, especially having no old queens in the yard, 75 per cent of these swarms would never issue.

The demand for honey is light locally, but I had an inquiry for a small carload about a month ago. I very much doubt if such an order could be filled by any one man or firm in Iowa.

Center Junction, Ia. W. S. Pangburn.

* * *

In Western Ohio — The outlook for a honey crop at this date (June 4) is not very promising. Unless rain comes within a few days the honey crop in northwestern Ohio will be a complete failure. We have had no rain to amount to anything for nearly three months, which, together with cold and frost, has certainly made things look very discouraging. However, beekeepers are the most optimistic people in the world and are always looking and hoping for better things tomorrow. The successful ones will stay with the ship, come what will, and some day the good seasons will come again.

The Tri-County Beekeepers' Association has ordered a car of cans, which, according to the present outlook, will be put in storage until another season. One of our members has received 500 three-pound packages of bees from Alabama. The unfavorable weather for building up colonies from packages makes this an expensive proposition.

Queen-breeders are having a good business and are well up with orders. This is a great help when the honey crop is a failure, since the queen business will furnish a means of living to those who rear queens for sale. We are devoting our 700 colonies to queen-rearing to make up for the possible failure in the honey crop.

Today the thermometer stands at 95° in the shade with some prospects of showers. Moisture is unequally distributed over the state and it is hard to say what the harvest will be. Clover is abundant, but is beginning to show the effects of the very dry weather we are having. The condition of the soil at present is very good, but the amount of moisture that has evaporated during the past three months has not been replaced.

The old crop of honey has been entirely sold out. Our inspector tells us that foul brood is still raging in some localities.

Preparations are going forward to make the summer field meeting a big success. It is to be held at Delphos, possibly at our Walnut Grove apiary. The date has not yet been definitely fixed, but it will be some time in August. We are planning a big banquet in the evening and are hoping for a large attendance. These summer meetings are always a source of great pleasure, affording, as they do, an opportunity to become better acquainted and to sympathize with each other as to our failures and rejoice over our successes. Fred Leininger.

Delphos, Ohio.

* * *

In Northern Indiana — There never has been a year when there was more clover, and the fields are now white with bloom. Until about May 15 prospects for a honey flow were excellent. Since that time there has been no rain, and though the bees are now gatherig nectar, it is probable that the flow will be cut short. Basswood is showing up well, but all depends on the prevailing weather during the few days it is in bloom. Thus far there has been almost no June swarming.

Old honey has been fairly well cleaned up. Commercial producers, however, still have some surplus to carry over. During the past season price-cutting has been rampant in this locality. Truck loads of comb honey from without the county and state have been brought in and it is being retailed at less than wholesale price. Some of our local beemen have created a market by advertising, and outsiders take advantage of it. It would seem that our greatest need is for

the education of beekeepers along the line of marketing.

The Northwestern Indiana Honey Producers' Association, through its Executive Commmittee, has issued the following recommendations to its membership and a copy has been sent to all known beekeepers within the territory:

That a constant supply of honey be furnished to grocers or to consumers.

That all honey thus sold be graded and that it be put up in suitable containers.

That no off-grade or cull honey be sold to dealers.

That a fair price be demanded as shown by quotations furnished through the Executive Committee.

That members of this association assist other members in disposing of any surplus honey.

That the price between members be the regular wholesale price based upon government reports as quoted by the Executive Committee.

That, wherever practicable, members of the association take over at a fair price all bees and equipment of any member forced to sell.

That odd lots of bees offered for sale at a reasonable price within the territory be purchased by members.

That members assist in every way possible in the eradication of foul brood, and that free transportation be given to state inspectors by members within their respective neighborhoods.

That all beekeepers within the territory be encouraged to join the organization.

It is the duty of the executive committee to issue at intervals marketing information and advice, and to see that this information reaches the hundreds of beekeepers who do not take bee journals and who need instruction in regard to business methods of handling, grading, and marketing honey. This committee consists of one or more leading producers in each county. J. M. Mundell, Hobart, Ind., is secretary-treasurer.

Valparaiso, Ind E. S. Miller.

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In Western New York—Our principal beekeeping operations, as well as those of the officers of our Western New York Association for the last few days, has been the catching of bee thieves. When we drove into one of our Pendleton yards, which is located some 20 miles from home, on the morning of May 29, we were greeted with a sight the equal of which we had never seen before. There was confusion on every hand. Supers, some of which were half full of new honey, were scattered around and about half of the hives were nowhere to be seen. With the surprise of the situation, it took just a few moments to realize what had happened. It was the first experience of the kind we had ever had.

As soon as we had collected our faculties we notified the sheriff's office and the officers of the association. With their help we worked for 48 hours traveling many miles and running down many clues. While visiting about two and a half miles south of Pendleton, we picked up a couple of splinters where evidently a beehive had been demolished, and at another place in the yard we found a little packing material such as we use, as well as a few other clues which led to a very strong suspicion that our bees were not far away. An official search of the entire premises revealed a good many articles which we could positvely identify as our property, and also some property of other beekeepers which had been stolen. The men were taken into custody, and after making a complete confession, were allowed to plead guilty to petit larceny and were fined $50.00 each and sentenced to six months in jail, the jail sentences being suspended. The court also required them to make restitution of $500.00 for the bees and equipment and also pay the $100 reward which the association offered for their arrest and conviction. Much credit is due the association, especially to the president, Mr. DeMuth, and the secretary, Mr. Wahl, for bringing these men to justice. After stealing the bees the men used them as package bees, shaking the bees into their own hives and then salvaging our combs and hives.

The early honey flow has been very good and all colonies are well supplied with stores to last until clover begins to yield. Clover is looking well, but not all the colonies wintered will be able to survive to give a surplus, as arsenic poisoning has again taken its toll, many yards having been almost annihilated. Prof. R. B. Wilson, of Cornell University, was in western New York for several days making observations on the poisoning of bees.

J. Roy Lincoln, of Niagara Falls, has sold his apiary and equipment to Edwin Deventier, of LaSalle. We are glad that this apiary passed into good hands, but we regret very much that Mr. Lincoln has given up beekeeping. He was one of the charter members of our association and has always been a faithful worker for the common good, and we hope he will continue to attend conventions and aid us by his counsel. H. M. Myers.

Ransomville, N. Y.

In Ontario—The month of May has gone on record as one of the coldest that Ontario has ever experienced. Someone who kept records told me that we had frosts nineteen nights out of the thirty-one in the month. While I can not vouch for the accuracy of this statement, certainly the month was out of the ordinary. As might be expected under such conditions, bees in many cases went back instead of ahead, and stores in strong colonies were used up very fast. Personally we have had but little feeding to do, though we are not sure just what is ahead of us in that line.

June came in sizzling hot and for eight days the mercury hovered between 90 and 100 in the shade. With but little moisture in the ground, clover was rushed into bloom fully ten days earlier than it should have appeared and fields are white at this time, June 10. However, it is, so far, absolutely devoid of nectar in our locality, hence the preceding remarks regarding the possibility of having to feed, as many colonies in some of the yards have but little in way of stores on hand.

Feeding reminds me of a fool trick that I did this spring in an effort to economize a bit. About the middle of May we found a few colonies in each yard that were getting on short rations, so we thought best to give them a bit of help. To avoid paying out money for sugar, I decided to feed some very dark honey that had been taken from the wax vats when we melted up the cakes from the capping press last fall. In the rush of extracting last season the cappings got ahead of the press, and many of these cakes of cappings had a lot of honey left in them. Some 500 pounds of this dark stuff that had been boiled and reboiled was in a tank in the wax room, and I thought it would be all right to feed so late as the middle of May. It was mixed with water and again boiled and all colonies that were marked "light" were given a ten-pound pail of the stuff. They took it out of feeders all right and I had no misgivings as to the result. Of course, I knew that boiled stuff of that nature would kill bees in winter, but anticipated no trouble in spring when bees usually fly freely about every day. But this spring they did not fly freely, and for as long as seven days they were confined to the hives. One day I happened to note bloated bees crawling around the entrance of one colony given this feed, and to my surprise and disgust I found this condition general with all colonies thus fed. As quickly as possible we removed all feed not taken, bought some sugar at once, and fed syrup, trying to undo some of the damage we had done.

In addition to causing adult bees to die we found later that the bulk of brood had been killed as well, so it was indeed a costly bit of economizing. As soon as the weather warmed up the trouble disappeared in so far as the adult bees were concerned, but colonies were all badly damaged by having so much of their brood killed at a time when it was most valuable.

Some kind friends have written me expressing concern and surprise over what we have written in these columns lately about the American foul-brood situation in our apiaries. One man asks, "How did you get foul brood among your bees, and do you ever expect to get rid of it?" Others have expressed themselves similarly and in other ways. As to how we got the disease in our apiaries, that is easier to answer than to say when we expect to get rid of it. Briefly, I might say that in almost every case of infection we have found our bees had robbed out foul colonies in neglected small apiaries near us. One instance will suffice and it applies to almost all our apiaries, with slight variations.

Two years ago this spring a well-known inspector called me up and asked whether we had been through a certain apiary of ours yet. I replied that we had examined every colony of the 130 in the yard and found them all clean. In fact, we had never had foul brood in that yard. He replied that we had better go through it again as soon as clover started to yield, as we would have a surprise in store unless he was greatly mistaken. With a chill running up my spine I ventured to ask what was the matter. He stated that but a few days ago he had gone into a farmer's place just a short distance from our apiary and found that two colonies of bees had been kept in a back yard. Both had died during the winter from American foul brood and the combs had been heavy with honey. Previous to the inspector's visit, the owner had opened the hives and tossed the combs full of honey about in the yard. When the inspector arrived, many bees were still around, but the honey was about all gone.

Using a central plant, it is quite possible that some of our supers may carry over a little disease each spring; but if so, it is very little indeed. For example, this large apiary of 130 colonies shows but two new cases this spring, and all super combs are used indiscriminately at all yards. In ten yards at the home section, one apiary shows no case of disease this spring, one has but one case, and none have over five. But it means a continual fight, much worry, extra work, and annoyance, as well as the continuous dread of a bad outbreak.

Markham, Ont. J. L. Byer.

HEADS OF GRAIN FROM DIFFERENT FIELDS

A Bad Case of Robbing Early one morning I found my bees seemed to be very busy. They were flying through the air everywhere, making a loud humming that one could not help noticing. I wondered what caused all these bees to be flying so freely in the morning when hardly any nectar was available, but I soon found the cause of all this commotion. During the night the cover of one hive had been blown off, and the bees were having the time of their lives robbing this colony. Before I found the trouble and put on the cover the bees had cleaned out about one super full of honey. The illustration shows some bees still trying to get at the honey after the cover was put back on. After the battle and the smoke had died down, there were thousands of dead bees lying in front of the hive, having met death trying to get in at the entrance. As robbing can easily be started this way, it is best to see that all covers are securely fastened. I. W. Westlund.

Hinkley, Minn.

Robbers trying frantically to get into the hive after the cover was put in place after having been blown off.

Charles Bangham, New Concord, Ohio, giving a live-bee demonstration that never fails to attract attention. He wears a bathing suit in this demonstration.

To Destroy Ants Here is the method I learned in Colorado for the destruction of ants that nest in the ground. Obtain a pint bottle that has no flange on top. Dig up the nest thoroughly, and set the bottle, half full of water, down in it with the top a little below the surface. Pulverize the dirt thoroughly on the sides leading down into the bottle. The ants are then in a state of great excitement. Rushing around at top speed they go to the opening and down the sides. The sloping sides being composed of loose earth (dry sand is better) they can not stop when they discover their mistake, and plunge down into the water and drown. Ants bothered me considerably till one of my neighbors told me of this plan.

Shreveport, La. Harry Martin.

Fewer Unfinished Sections When taking off comb honey, as soon as enough unfinished sections have accumulated to fill one or more supers they should be returned to a colony with bees known to be exceptionally good honey-gatherers and finishers—one that fills the sections full, caps them white, and is not inclined to use propolis to excess. The sooner unfinished sections are returned to be completed, the better and more satisfactorily the work will be done. If a colony possessing all the desirable qualities as finishers has but one partly filled super, rapid and good work may be expected if a super of the most nearly completed sections is placed on top. Other colonies desirable for the work may have supers fairly well filled. In such a case sections not so near completion may be placed under the one already on the hive. To be sure, it is some work to sort out and return the unfinished sections, but it pays. A sec-

tion may be well filled, yet if it is not capped the price is not there.

Even in a small apiary there may be found colonies that forge ahead of the others, working later in the season, gathering and storing when others do almost nothing. To spot the good colonies for finishers it is well to watch for them during the season and when removing sections.

A. C. Gilbert.

East Avon, N. Y.

Extracting Unfinished Sections To extract unfinished sections I have found it very convenient to use section-holders with strips of wood the same width and length as the bottom-bars, tacked to the tops of the end pieces. By this means the section-holders easily become four-sided frames which hold snuggly four sections each.

If the extractor pockets are twelve inches wide each will accommodate two frames filled with four by five sections. With a two-frame extractor sixteen sections can be extracted at once and of course more with a larger machine. This method is efficient, no special equipment is required, and the section-holders can again be used as such when needed.

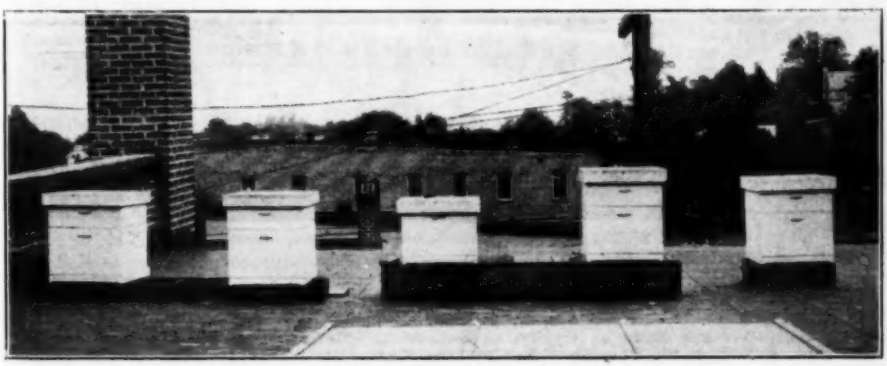
To uncap sections a very handy knife can be made from a small trowel such as masons use for pointing.

Kitchawan, N. Y. Herbert Lyon.

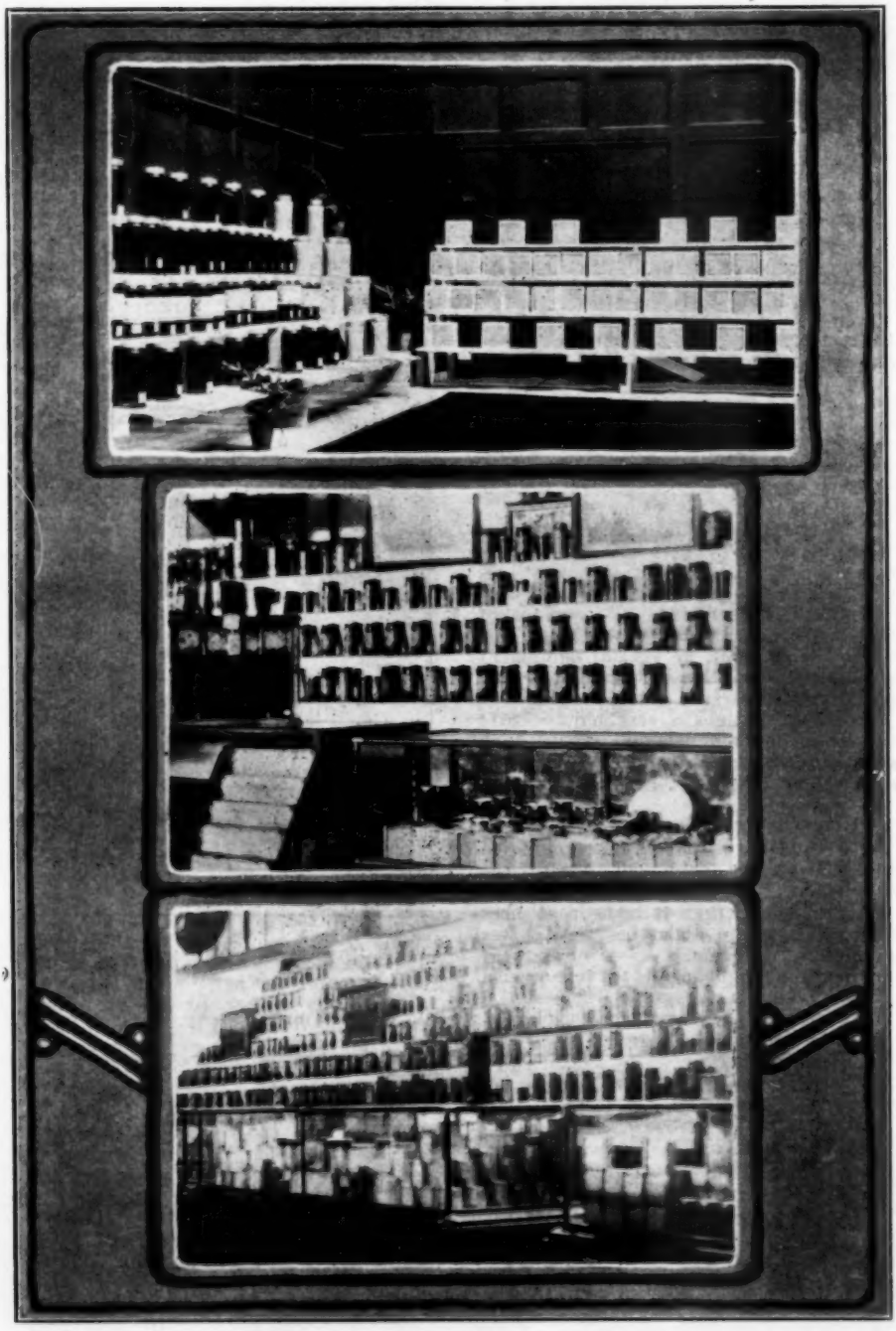
Bees in Days of Solomon On page 220, April issue of Gleanings, Mr. Baldensperger tells us that bees were unknown in Palestine until after the time of Solomon. I know nothing of the Hebrew language and have no wish to doubt the statement, but I can't imagine what the conditions might have been when it could be said that Samson took grape juice from a nest of wasps and went on eating it from his hand, and also gave it to his father and mother. (Judge 14: 8, 9) And according to the chronology of our Bibles this was something like 126 years before the time of Solomon. Jacob told his sons to take a present to the governor of Egypt, and among other things mentioned honey. This might have been grape juice, though it would seem like "carrying coals to Newcastle," for no doubt there was plenty of wine in Egypt.

Bravo, Mich. Mrs. Emily Hafford.

L. E. Webb, photographer, of Morgantown, N. C., gets his diversion from his apiary, located on the roof of his studio.



L. E. Webb's apiary, located on the roof of his studio, from which he obtains good crops of honey. Such apiaries on the roofs of buildings are to be found even in many of the largest cities.



HONEY DISPLAYS IN ENGLAND AND AMERICA.

Upper—An attractive display of honey at a summer flower show in England. Displays of this kind are considered one of the finest ways to promote the sale of English honey. Middle—Part of the honey exhibit at the Ohio State Fair in 1924, displaying well-filled combs to be extracted at the exhibit, as well as comb honey in sections and extracted honey in glass. Lower—Another view of the honey exhibit at the Ohio State Fair.

TALKS TO BEGINNERS

Geo. S. Demuth

In many localities the main honey flow (if there has been one) will close during this month. In fact, where the drouth has been most severe in the clover region the main honey flow may close early in the month, since hot, dry weather tends to shorten the blooming period of this plant. On the other hand, localities that have had plenty of rain may be blessed with a prolonged honey flow extending well into July or even into August. In some of the northern tier of states and in portions of Canada, as well as in the sweet clover and alfalfa region of the West, July is usually the best month for honey. In a few localities, such as the buckwheat region of New York and Pennsylvania, the main honey flow does not begin until August and September, and in swampy localities as well as other localities during a wet season where fall flowers are abundant there may be a fall honey flow of considerable magnitude, beginning in late July or early August and continuing until frost. However, for the greater portion of the United States there is no dependable fall honey flow and in many localities the bees are scarcely able to gather enough for their living after this month.

Indications of the Closing of the Honey Flow

As the close of the honey flow approaches, especially if it tapers off gradually instead of closing abruptly, the bees are inclined to store more honey in the brood-chamber, neglecting work in the supers. As brood emerges in the upper portion of the combs the cells are filled with honey and the brood area is thus crowded, becoming smaller and smaller. The bees are also inclined to discolor the newly-built combs with propolis, giving them a varnished appearance often called "travel stain." As nectar becomes scarcer, the drones are crowded down to the floor of the hive or out at the entrance and occasional workers will be seen struggling with the drones. Later the drones in their weakened condition from lack of food are dragged from the hive.

As nectar becomes less abundant, the bees are inclined to become cross, so that the beginner who has learned to handle his colonies without fear of stings may find that they have suddenly become ill-tempered and difficult to handle. Great care should be taken as the close of the season approaches to avoid stings and the colonies should not be handled unless necessary when nectar is not abundant.

Another difficulty for the beginner as the close of the season approaches is that of robbing. When nectar is no longer abundant in the field, it is difficult to open a hive and expose the combs for even a minute (if other colonies are near) without starting robbing. If it becomes necessary to open the hive at such a time great care should be taken to keep all the combs as well covered as possible and the work should be done as rapidly as possible to prevent exposing honey to robbers. Pieces of canvas can be used to cover a portion of the top of the hive and any combs that may be taken out and placed in an empty hive while working with the colony.

Arrangement of Supers

When supers for extracted honey are arranged as described last month it is usually necessary to rearrange them as the close of the honey flow approaches, in order not to have the honey scattered through too many supers. It will be well to have the super in which the queen was permitted to lay during the month of May well filled even if none of the rest of them are filled. This super in which brood has been reared is in good condition to leave with the bees to supply a great abundance of stores for fall, winter, and spring. If a super of empty combs was placed between the super which contained brood and the brood-chamber, and has not been filled, it is a good plan to transpose these two supers, placing the one to be left with the bees down adjacent to the brood-chamber before the close of the honey flow in order to have it well filled. Where several supers have been tiered up on the hive, as the close of the honey flow approaches it is sometimes well to place the one containing the least honey on top in order to have the others better filled.

Where the honey flow has been good so that comb-honey supers were tiered up as described last month, these should be rearranged with great care toward the close of the season in order to have as many as possible of the sections completely filled and sealed. On the first indiction of the close of the honey flow the super in which the least work has been done should be placed on top and the others arranged for the most advantageous finishing. As a rule, comb-honey supers should be taken off before the sections in the outer corners have been finished, for if left on the hive until every section is finished those which were sealed first will become discolored. So far as the appearance of comb honey is concerned, it would be better if each section

could be taken from the hive on the day the bees finish capping it, but since this is not practical it is usually best to wait until most of them are sealed. The discoloration of the cappings is worse in poor seasons than during good seasons. It is also worse toward the close of the honey flow than during the middle of the honey flow. During a poor season it is sometimes advisable to take off the comb-honey supers when even half of the sections are finished.

While during the early part of the honey flow the super room is expanded as fast as the bees can use more room, during the latter part of the honey flow the super work should be concentrated as much as possible. When comb-honey supers are tiered up several high during a good season, it is well to take off those nearest finished as the close of the season approaches and sort out the unfinished sections to be assembled in one of the supers and returned to the bees to be finished. In doing this those sections nearest completion should be placed in the middle of the super, in order to insure more prompt finishing.

Where the honey flow has been so poor that only one comb-honey super was given, it is sometimes advisable to take out the finished sections as the close of the honey flow approaches, then move the ones nearest completion to the middle of the super and put in sections containing foundation at the sides, provided the bees are still gathering enough nectar to cause them to draw out the foundation.

Taking Off Finished Supers

To take off supers of honey by means of the bee-escape, all that is necessary is to raise up one end of the super, slide the escape-board containing the escape in position as far as it will go, then let the super down in place and line up the escape-board and super with the hive below. As a rule, most of the bees will be out of the super within 24 hours, but at the close of the season when the bees become less active it may require longer. During the honey flow twelve hours is often sufficient to clear the super of bees.

Great care should be taken when bee-escapes are put in place to see that the covers fit perfectly, since, if any should not, robber bees may crowd their way into the supers, and the honey, no longer being protected by the colony, would soon be robbed out. If the bee-escape is not used, most of the bees can be smoked out of a comb-honey super. For this the smoker should be filled with fresh fuel, so that no sparks or ashes will be blown into the honey. By a series of light puffs of smoke directed down between the combs, most of the bees can be driven out of the super. In driving the bees down they should be kept on the go and not permitted to stop long enough to get their heads into cells of honey, since when they do this they pay but little attention to smoke. While the bees are being driven down, the super should be pried loose from the hive, and when most of the bees are out of it one end should be lifted and drawn back far enough on the hive so that it can be tipped up endwise, the lower end resting on the hive. This should be done quickly and the bees clinging to the bottom of the super should be brushed off immediately before any of them can go back into the super.

In taking off extracting supers, most of the bees can be driven down with smoke, then each comb can be taken out separately and the bees brushed off. The combs, as they are freed of bees, can then be set into an empty super that is kept covered with a piece of canvas to keep out robbers.

Care of Honey After Being Removed from the Hive

Honey that is to be extracted should be left on the hives until at least two-thirds of the surface of each comb is sealed, in order to be sure that the honey is well ripened. When taken off, this honey should be extracted immediately unless it can be stored in a heated room where it can not absorb moisture.

As mentioned above, sections of comb honey should be entirely sealed except possibly the outside row of cells; and when taken from the hives the supers of comb honey should be placed in a warm, dry room. Supers of finished honey can be piled in a tight pile and covered with a hive cover. This will prevent a circulation of air among the combs which, unless the air is dry, may result in the absorption of moisture even through the cappings of the honey.

Ten days or two weeks later, it is well to examine the combs carefully to look for indications of the wax moth. If any are present, little bits of wax resembling fine sawdust can be seen here and there, indicating the work of the wax moth larvae. If any are found, they can be killed by fumigating the entire pile of supers by means of carbon bisulphide. To do this, measure out an ounce of carbon bisulphide for six comb-honey supers, placing it in a small dish on top of the pile and inside of an empty super. The entire pile should then be covered tight so that the fumes from the evaporation of the carbon bisulphide will be confined. After a few hours the pile of supers should be taken down and repiled in order to permit the fumes to escape. The carbon bisulphide can be obtained from almost any drugstore.

JUST NEWS
Editors

Dr. E. F. Phillips, professor in beekeeping, Cornell University, has recently been honored by being chosen as alumni trustee of Allegheny College, Meadville, Pa., his alma mater.

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The new bulletin, "Honey, Its Uses in the Home," by Ruth Jordan, published by Purdue University, Lafayette, Indiana, is now being distributed. This bulletin should help stimulate the use of honey as a food, since it sets forth its value in an attractive manner.

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The State Board of Agriculture of Alabama has adopted an amendment to the state apiary inspection law, prohibiting the shipping of bees on combs into the state. This is considered an important move to protect the breeders of queens and package bees in that state.

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The Missouri Board of Agriculture has been compelled to discontinue the office of State Apiarist and inspection work on account of the failure of the last legislature to renew the appropriation for this work. This leaves Missouri in the unfortunate position of being without inspection work in the state.

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Gene Stratton-Porter's new novel, "The Keeper of the Bees," which is being published serially in McCall's Magazine, is now announced in book form by Doubleday, Page & Co. This is not a treatise on beekeeping, but a delightful story that should help to remind the American people that there is such a thing as honey.

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The schedule committee of the American Honey Producers' League for eastern United States has arranged for the following series of meetings: August 1, the Vermont State Beekeepers' Association at Middlebury, Vt.; August 4 and 5, Western New York Beekeepers' Association at Williamsville, N. Y.; August 5, Michigan State Beekeepers' meeting at East Jordan, Mich.; August 6, New Jersey Beekeepers' Association at the apiary of T. A. Morrow, Livingston, N. J.; August 7, The Empire State Federation of Beekeepers at the apiary of A. A. French & Son, Theresa, N. Y.; August 25 and 26, the New Hampshire Beekeepers' Association at Durham; August 29, the Rhode Island Beekeepers' Association at Providence; September 7, Maryland Beekeepers' Association at the Timonium Fair, near Baltimore; September 8 and 9, Tennessee Beekeepers' Association, place not yet announced; September 10 and 11, a combined meeting of North and South Carolina Beekeepers' Associations at Charlotte, N. C.; September 14 and 15, the Georgia Beekeepers' Association at Valdosta, Ga.

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The annual field meeting of the Ohio State Beekeepers' Association will be held at Delphos, Ohio, on August 20, at the queen-rearing yard of Fred Leininger, located two miles east of Delphos and twelve miles west of Lima on the Harding Highway.

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Dr. Ferdinand Gerstung, the well-known German beekeeper, editor, and writer, who died on March 5 at the age of 65, was one of two men who have been honored with a doctor's degree as a reward for services to beekeepers, Dr. Kramer of Switzerland being the other. Dr. Gerstung was an ardent advocate of top-opening hives, as used in this country, instead of those opening from the rear, as used in Germany. He also held that the entire colony must be regarded as a single organism instead of being a collection of individuals.

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"The Flight Activities of the Honeybee" is the title of the United States Department of Agriculture Bulletin No. 1328. This is the bulletin from which some extracts were sent out in advance to the press and which have brought forth an unusual amount of comment from the newspapers of the country on the activities of the honeybee. Newspaper writers, not understanding the behavior of the honeybee and having only a few extracts from the bulletin, jumped to the conclusion that the honeybee is not as busy as she has been credited to be. The scarcity of nectar at the time the experiments were conducted is mentioned in the bulletin, which explains to a large extent the small number of trips made to the field by the nectar-gatherers before death overtook them, it being necessary in this case for individual bees to search long before a load of nectar was obtained. The bulletin describes a remarkable piece of research work by Dr. A. E. Lundie, in which outgoing and incoming bees were counted mechanically throughout the season. Only a limited supply of this bulletin has been printed, but copies may be obtained as long as they last by request to the Office of Publications of the Department of Agriculture, Washington, D. C.

GLEANED BY ASKING

Geo. S. Demuth

Prevention of Swarming

Question.—Should I take all of the queen-cells from the parent colony after a prime swarm issues in order to stop after-swarming? Does the parent colony have a queen when the prime swarm leaves? Allen D. Louden.
Pennsylvania.

Answer.—One queen-cell (the finest looking one) should be left to requeen the parent colony. When a prime swarm issues in a normal manner the parent colony is without a queen except the unemerged queens in the queen-cells, and if the cells are all destroyed, the bees would be compelled to start some new ones. When preventing after-swarms by this plan it is well to wait about five days after the prime swarm issues before destroying the queen-cells, since, if they are destroyed immediately after the prime swarm issues, the colony may start additional queen-cells from the young larvae then in the hive.

Source of Royal Jelly

Question.—Where do the nurse bees obtain royal jelly? F. Sheill.
Michigan.

Answer.—Royal jelly is a secretion by the nurse bees. In this respect it is comparable to the milk of mammals. It is now generally conceded that the glands which produce the larval food are the pharyngeal glands located in the head of the worker bees.

Best Method for Making Increase

Question.—We would like to increase 10 colonies as much as possible, whether we obtain any surplus or not, and would like to know the "up-to-the-minute" plan for making increase. Lake Sarah Specialty Farm.
Minnesota.

Answer.—The "up-to-the-minute" plan for making increase in the North is that of purchasing package bees from the South in the spring. In this way a crop of honey is secured the first season if the season is at all favorable. In fact, colonies built up from two-pound packages installed about six weeks previous to the main honey flow should store as much surplus as wintered-over colonies. It should be more profitable to operate the ten colonies for honey this season, then use the proceeds in purchasing package bees next spring, than to sacrifice this season's honey crop to make increase. At the close of the main honey flow in your locality you can, if you desire, divide each of the ten colonies, making two from each. If this is done at the close of the main honey flow in July in your locality, you will not have sacrificed any of the main honey crop; but of course it would be necessary to supply each of the divisions with sufficient food for fall, winter, and spring, unless there is a good fall honey flow.

Bees Fail to Work in Second Super

Question.—I took off the supers from my colonies several days ago and took out the honey, then placed the supers back on the hive as quickly as possible, but the bees have not gone to work in them. Can you tell me what is the trouble? Mrs. W. H. Moulden.
Mississippi.

Answer.—The bees may not now be obtaining sufficient nectar to cause them to work in the supers, or it may be that the colonies became so crowded before the last super was filled that they were compelled to cease work. When this occurs it is sometimes several days before the colonies get back to normal working condition. It is not well to compel the bees to fill completely the first super before the second is given. As soon as work is well along in the first super it is well to give a second, if the honey flow is good, in order that work may not be slowed down for lack of room to store incoming nectar.

Treatment for American Foul Brood

Question.—What is the best practical treatment for American foul brood in small apiaries?
Idaho. J. A. Haynes.

Question.—If but one or two colonies are to be treated and this can be done during the honey flow the bees may be shaken or brushed from their combs into a clean hive, using extreme care not to have any honey smeared around. The combs should then be burned immediately, for it would scarcely be worth while to try to save the combs and brood on account of the small number. The new hive may contain a few frames provided with narrow strips of foundation at the time of treatment; then a few days later filled out with full sheets of foundation. A queen-trap or an entrance-guard should be put on the hive so that the queen can not escape if the treated colony should swarm out. If several colonies are to be treated the brood can be saved by tiering up the hive-bodies containing it on top of one of the diseased colonies. Three weeks later when this brood has emerged, these tiered-up colonies should be treated by shaking as described before, and the combs should be sterilized or melted for wax. Colonies in which the disease has been permitted to run for a long time so that they are greatly weakened are scarcely worth treatment and may as well be killed by closing the entrance of the hive in the evening, then carefully raising the cover and pouring in about a half pint of gasoline and closing the hive tightly. As soon as the bees are dead, the combs and bees should be burned or the bees should be brushed from the combs into a pit and buried and the combs immediately sterilized with the alcohol-for-

malin solution according to the directions for doing this. The empty hives should be carefully cleaned, then lightly scorched on the inside with a painter's blowtorch or washed with the alcohol-formalin solution and closed up tightly to retain the fumes.

Energy of Bees in Tropics

Question.—Is there any truth in the rumor that bees when shipped to the tropics will store surplus honey for a while, then work only enough to store a few days' supply in advance? D. D. Stover.
Mississippi.

Answer.—Evidently there is no truth in this rumor. Colonies of bees in the north, if properly cared for, usually obtain greater strength in the spring than do colonies of bees in the tropics. For this reason good colonies in the north may store more nectar during the day if the nectar is available in abundance than colonies in the tropics, but this may be because of a greater number of workers rather than because of any difference in the energy with which they work. Furthermore, the nectar-secreting plants apparently yield more abundantly in the cooler climates than they do in the tropics.

"Sky-Scraper" Hives

Question.—Why do some people tier up their hives in the manner they do? See the cut on page 344 of the May issue of Gleanings. What is the idea? C. D. Calkins.
Missouri.

Answer.—During a good honey flow a strong colony of bees will sometimes fill several full-depth extracting supers before the honey is sufficiently ripened to seal. When this occurs it is necessary to tier up the supers in order to give sufficient room for all the honey the bees can gather. This is especially true in a damp climate where the nectar is thin and does not ripen rapidly. In the arid regions of the west and during dry seasons in the east, such tiering up is not often necessary. Another reason for tiering up in this manner is that some extensive beekeepers prefer having enough supers to contain the entire crop of honey and leave it on the hives until the close of the season to make sure of its being well ripened.

Opening Between Supers for Ventilation

Question.—Is it advisable to allow an entrance between supers when they are tiered up five or six high so that the bees will have a shorter distance to go from the fields to the supers? Grover Lay.
Tennessee.

Answer.—When producing extracted honey it is sometimes advisable to slide one of the supers forward to make an opening for ventilation. Bees do not use such an opening to any extent as an entrance, but during hot weather it is beneficial as additional ventilation. However, when producing comb honey this can not well be done, for the bees do not finish comb honey well near an opening.

Incubation Period for American Foul Brood

Question.—How long is it before American foul brood develops in a colony after the germs of the disease have been carried into the hive by robbing out a colony dead from the disease? M. D. Smith.
Iowa.

Answer.—The first symptoms of American foul brood appear at about the end of the first week after infection. Usually the symptoms can readily be seen during the second week following the infection.

Fumigating Comb Honey

Question.—In fumigating comb honey with carbon bisulphide or sulphur fumes, is the flavor of the honey affected, and is there any danger in eating such honey? Also, what is the best way to fumigate comb honey?
North Carolina. L. J. Brown.

Answer.—When either carbon bisulphide or sulphur fumes are used for fumigating comb honey there is apparently no odor absorbed by the honey provided it is promptly aired after being fumigated. There is no danger from eating fumigated comb honey. Carbon bisulphide is the most convenient fumigant for comb honey. To fumigate comb honey with this material, pile the supers in a tight pile, then place the carbon bisulphide in a shallow dish in an empty super on top of the pile and cover tightly. Use one ounce of carbon bisulphide to a pile of six supers and a proportionately larger amount if the pile contains more than six supers. After three or four hours the pile can be torn down and the supers piled criss-cross in order to permit the fumes to escape. As a rule, it is well to wait about ten days after the honey has been taken from the hive before fumigating in order to allow time for the eggs, if any, to hatch. If moth larvae do not develop in comb honey that has been kept in a moth-proof room for two or three weeks after being taken from the hive, there is but little if any danger of any developing later.

Newspaper Plan for Uniting

Question.—In Jay Smith"s article in the May issue of Gleanings in Bee Culture he says: "Lay a newspaper on that—". Does he mean a sheet of paper should be placed between the lower brood-chamber and the first super? What is this paper for? Will the bees from the brood-chamber not go up to the brood-chamber that has been made queenless and put up a stiff fight? Geo. A. Kaufman.
Minnesota.

Answer.—The reason for the sheet of newspaper between the brood-chamber and the supers as described by Jay Smith in his article in the May issue of Gleanings is to cause the bees to unite without fighting. This is usually referred to as the newspaper plan for uniting. In gnawing away the paper, the bees unite peaceably. The management outlined by Mr. Smith involves the uniting of the two colonies just previous to the main honey flow, and this uniting is really done by the newspaper plan. In this case, the supers are placed between the two colonies being united.

BEES, MEN AND THINGS
(You may find it here)

"My bees are at this date (June 8) flooded with honey."—E. B. Kauffman, Lancaster County, Pa.

"The late freeze destroyed the honey plants, and set the bees back very materially by chilling the brood."—T. K. Massie, Mercer County, W. Va.

"The honey crop is a complete failure on account of drouth. The bees are just making a living thus far. Clover is dried up."—C. F. Bender, Douglas County. Ill.

"Beekeepers are feeding sugar, as dandelion and other early spring sources of netcar have been much shorter than usual because of dry weather."—Chas. H. Ranney, Fremont County, Wyoming.

"No amount of rain can now save the clover. We are hoping the weather may change so that basswood and sweet clover may give enough to winter the colonies."—Floyd Markham, Washtenaw County, Mich.

"Bees did fine during those few hot days. Clover is just coming in bloom, but it is cold again today (June 11). I look for a fair crop. Clover is fine now and basswood is budded full."— Geo. B. Howe, Jefferson County, N. Y.

"In a trip of about 100 miles in the country a few days ago it seemed to me I have never seen the honey plants in better condition, especially black and white sage and wild buckwheat. It made me want to be busy with the bees again." F. C. Wiggins, San Diego County, Calif.

"The bees started out storing early here, but they have restricted brood-rearing to a certain extent. They are storing a little in extracting supers, but none in comb-honey supers. Even with plenty of rainfall from now on we can expect but half a crop."—Albert Watermeier, Macoupin County, Ill.

"Bees have dwindled in spite of all we could do. We have had no rain of any account since March. But little pollen and no honey has been gathered to date (June 11). Extreme heat and cold with heavy winds and no rain have prevailed. Prospects are as bad as I have ever known."—Ira D. Barlett, Charlevoix County, Michigan.

"The honey flow started two weeks earlier here this season than last, with the result that colonies are storing surplus now (June 17). In two of my yards I found the colonies finishing their first super. We certainly appreciate the recent rains after the late frost and dry winds."—J. Howard Wagner, Merrick County, Neb.

"It is still dry in west Texas. While we expect to get about 40 pounds per colony we should get 100 pounds or more if rain comes in time. This has been a bad year for bee-men, since the drouth and low price together make times look very hard. Our colonies yielded 250 pounds last year, but if we get 150 pounds this year we will do well."—A. B. Anderson, Brewster County, Texas.

"One day the thermometer here was 100° in the shade, and the next night ice was formed. This is the year when the beekeeper of good sense and judgment left lots of stores with his bees. With very little favorable early spring weather, the hives were full of brood and most of them light in stores the first of June. White clover just coming into blossom was frozen down."—A. B. Silliman, Boone County, Iowa.

"We organized the Muskingum Valley Beekeepers' Association on March 20 for the purpose of improving beekeeping conditions in this locality and to prevent and eradicate so far as possible the brood diseases, especially the dread American foul brood. Our work in this direction so far has been very encouraging, and we hope that no one will hesitate to bring their case to our attention."—Joseph MaCarty, Muskingum County, Ohio.

"I have been keeping bees over 45 years and have been a reader of Gleanings for more than 44 years. I have something over 300 colonies in six yards. I note that in a smoker-lighting contest some one thought two minutes is a short time to get the smoker going well. I can do this in one-fourth of that time. I use pine needles or straw for fuel and 30 seconds is all of the time I need to get a good smoke. To get a dense smoke I break off some green pine twigs and put them on top of the hot ones."—Robert H. C. Simpson, York County, S. C.

"While European foul brood is known in this section, it has not given us any bother for the last five or six years. Commercial honey production has increased wonderfully during the past three years in this region. The Norfolk market absorbs more honey than this region produces. Most beekeepers retail their honey on the market, some selling as low as 50c a quart in fruit jars. The general price is 65 to 75 cents a quart. Comb honey retails at from 25 to 35 cents a section. Chunk honey in glass sells the best in this market."—E. S. Miller, Princess Anne County, Va.

A. I. Root's Story of His Own Life

The wicked encompassed me about like bees; they are quenched as the fire of thorns: for in the name of the Lord I will destroy them.—Psalm 118:12.

On one occasion I was troubled with a large number of black robber bees that by some hook or crook managed to get at my surplus combs in spite of all I could do. They would even burrow in the sawdust with which some of the hives were closed, until they got in and then away went the contents of the well-filled combs.

One morning, after having become tired of the pilfering at every hive I opened, I bored a hole in the front of the hive that the bees knew the contents of, and allowed them to go in and out until they were really doing a land-office business. I then pushed into the hole a wire-cloth tube with the inner end raveled out and the loose ends brought near each other. Of course, as soon as this device was ready the bees crowded in until every last robber had disappeared and peace and tranquility reigned in the apiary. During the day a few more would come now and then, while the squealing of their comrades who wanted to get out would very soon draw them into the hive and in a trice they, too, would be safely bagged, for the tube reached nearly to the center of the hive.

I supplied a comb of brood from an imported Italian queen just after dark and left the bees closed up nearly a week, hoping they might become honest. When I finally decided to let them out they poured out in such a stream that I feared they were only robbers still, but after about fifteen minutes I was astonished to see a crowd of bees back again before the entrance struggling to see which could get in first, and every one was laden with huge pellets of beautiful snow-white pollen that contrasted so ludicrously with their jet-black bodies that I shouted with laughter.

I would like to add that these bees built up to a fine colony, but they did nothing of the kind. In less than two weeks nearly every bee was gone. They probably died of old age.

A New Way to Stop Robbers

On one occasion robbers got the best of me and by sheer force of numbers pounced on and overpowered four of my colonies. I had no choice but to close the entrances and then open them just at dark to let the robbers go home, hoping they would all get ready to keep down such attacks before morning.

The next morning I got up before five o'clock, so did the robbers. What was to be done? I sat on the hive and debated, then looked up the colony that was doing the robbing, which was an easy matter on account of their excited and crazy activity, the rest of the colonies all being quiet. A minute more and I had carried their hive into the house apiary, and put in place of it a hive containing empty combs only. The entrances of the hives they had been robbing were now opened and when the robbers had poured in and got their fill they fairly made the gravel fly behind them in their haste to get home and back again. Of course, I was right at the entrance of the hive containing the empty combs; and such astonishment and lamentation as these robber bees set up when they discovered the condition of their hive! They would back out of the hive, take wing, and try it again; but their ambition was completely crushed and after every robber had got one load, there was peace and quietness. Of what use to put their precious load in empty combs with neither a queen nor brood? They were very soon humbly bringing pollen to rear a fresh lot of queen-cells from some eggs that I gave them.

An Intentional Robbing Fracas

In 1879, for the purpose of experiment, I took into the apiary an extractor can nearly full of broken honey left after transferring and placed it under the trees. The bees smelled the honey at once and in fifteen minutes there was a pretty fair buzzing about the can. In fifteen minutes more the apiary was in an uproar, and in an hour from the start I was obliged to close the entrances to the strong colonies to prevent robbers from pushing their way into them in such masses that resistance was simply out of the question.

It was a dangerous experiment, but I allowed the bees to go on for some time longer until I was fully satisfied that it would end in the destruction of a great many colonies, if it did not endanger the whole apiary. What was to be done? I tried putting a cloth cap over the can, but found it would certainly smother

large numbers of bees. The can could not be carried away, for the bees followed in frantic thousands. The wire-cloth house was just the thing. It was put over the can and in a twinkling there were great masses of bees clustered on the outside wanting to get in, and about as many on the inside wanting to get out. In an hour there was tolerable tranquility, and most of the hives that had been closed could be opened by giving them but a small entrance. By letting them out of the wire-cloth house at intervals they were allowed to take all of the honey, but the bees were daubed, blackened, and demoralized.

Sheet of Glass Confuses Robbers

In order to deceive robber bees I tried a looking glass placed at the entrance, also plain glass. The latter, by reason of the transparency, does not alter the appearance of the entrance, and the robbers, being received, will worry and weaken themselves much in the same way that they do in trying to get through a window. On further trials, however, although the glass in many cases answered a very excellent purpose, I decided I should prefer to contract the entrance of the hive being robbed by the usual plan, since I found that the glass would worry the occupants of the hive as well as the robbers.

The Language of the Bees

It is a very pleasant piece of fiction that bees have a language of their own and can communicate to their fellows where plunder is to be had, but I think their vocabulary must be rather limited.

On the 18th of October, 1876, the door of the honey-house by some means got open and at noon I found the bees in a terrible uproar over my sections of comb honey. The door was closed and when those inside were all on the glass it was then opened just long enough to let them out. As a fresh army rushed in at every opening it was some time before all of them were out. As each lot of bees rushed laden into the hive a swarm of workers came out and made straight for the doorway.

At night the bees had given up buzzing around the door, and a feeder was placed in front of the hive, which I watched until a few bees were ready to go inside with a load of honey. Almost as soon as they were out of sight a lot of bees came tumbling out of the hive and went straight for the door of that honey-house. More kept coming, and I finally was convinced that they merely know when a bee comes in laden that it has obtained its load somewhere, and the only way they have of finding the exact spot is to look in every direction until they discover it.

Cage for Winter Flying

A subscriber in the year 1874 made a light frame about 2 feet square, covered the four sides with wirecloth and the top with thin boards except a square hole in the center about as large as the inside of a hive. He placed a colony of bees on top of this cage in a warm room and let them fly through the winter, reporting that the bees got back into the cluster all right. All colonies set over this cage for a flight began to rear brood, though they had none before. It seemed to me that this brood-rearing in January might prove an injury to a strong colony, but I think it would certainly prove advantageous to a weak colony providing they could have warm quarters afterwards in which to mature their brood.

Midwinter Flights in a Hotbed

In the Beekeepers' Magazine for September, 1874, appeared a paper by one H. E. Bidwell, describing an experience in putting colonies of bees into a hotbed 6 x 12 feet and 3 feet deep, so that they might have a chance to fly. Every bee was reported to have found its way back into the hive. I resolved to give the matter a careful test and report from month to month. If the plan enabled me to feed meal in the spring without the usual loss from cold winds, I considered it of much more moment, perhaps, than simply helping the bees to winter well.

[The hotbed idea suggested to Mr. Root the possibility of using artificial heat in wintering bees, and he immediately began experiments along this line which led to some careful observations of the behavior of bees in winter. In the next few installments of this autobiography these are described in detail.—Editor.]

Probably the last photograph of A. I. Root. This was taken at his winter home in Florida just as he was driving out with his electric automobile. The power for operating his electric automobile was supplied by his windmills, one of his last hobbies being the utilization of wind power for transportation in this way.

Classified Advertisements

Notices will be inserted in the classified columns for 7c per word. You must say you want your advertisement in the classified columns, or we will not be responsible for errors. For special conditions on bee and queen advertising please write us. Copy should be received by 15th of preceding month to insure insertion. Cash with copy if credit has not been established previously.

REGULAR ADVERTISERS DISCONTINUED IN GOOD STANDING.

(Temporary advertisers and advertisers of small lots, when discontinued, are not here listed. It is only regular advertisers of regular lines who are here listed when their advertisements are discontinued when they are in good standing.)

O. G. Rawson, A. I. Root Co. of Iowa, L. R. Marsalek, Chas. E. Schneider, Gilbert J. Sergeant, A. M. Moore, E. S. Robinson, Powell Owen, The Scott Apiaries, John A. Williams, F. H. Coombs & Son, Ault Bee Co., John G. Miller, Schenectady Bee Supply Co., Majors Nordan, W. A. Holmberg, Shaw & Ramsey, E. A. Simmons, S. H. Hailey, New England Apiaries, Superior Honey Co., Barker Mfg. Co., MacGraw-Hill Book Co.

HONEY AND WAX FOR SALE

NEW comb honey now ready to ship. H. G. Quirin, Bellevue, Ohio.

FOR SALE—New white comb honey, packed in carriers. I. J. Stringham, Glen Cove, N. Y.

HONEY for sale, any kind, any quantity. The John G. Paton Co., 217 Broadway, New York City.

FOR SALE—Comb and extracted white clover honey. Prices on request. Dr. E. Kohn & Son, Grover Hill, Ohio.

FOR SALE—Extracted, comb and chunk honey. Prices on request. Sample 15c. F. W. Summerfield, Waterville, Ohio.

HONEY for sale in 60-lb. tins, clover crystallized, at 13c per lb.; clover liquid at 14c per lb. Hoffman & Hauck, Inc., Ozone Park, N. Y.

FOR SALE—White honey in 60-lb. cans, also West Indian in 50-gallon barrels. Samples and prices on request. A. I. Root Co., 16-18 Jay St., New York City.

RASPBERRY and milkweed, two of the best honeys of northern Michigan, blended. In 10-lb. cans by mail, postpaid, for $2.50 a can. Elmer Hutchinson & Son, Lake City, Mich.

HONEY AND WAX WANTED

WANTED—Honey, comb and extracted, in ton or less lots. State quantity, grade and price. W. I. Boggs, De Soto, Mo.

WANTED—A car or less quantity of clover honey in 60-lb. cans. Mail sample and quote lowest cash price for same. A. W. Smith, Birmingham, Mich.

WANTED—Clover and raspberry honey, comb and combless. Give description, quantity and best price delivered here. E. W. Peirce Co., 28 W. Main St., Zanesville, Ohio.

BEESWAX WANTED — Highest market prices paid. Cash or in exchange for supplies. Write us for quotation before shipping elsewhere. The A. I. Root Company, Medina, Ohio.

WANTED—White clover comb and extracted honey. Write me as soon as you have some to take off, giving price, etc. John N. Prothero, DuBois, Pa.

WANTED—Shipments of old comb and cappings for rendering. We pay the highest cash and trade prices, charging but 5c a pound for wax rendered. The Fred W. Muth Co., Pearl and Walnut Sts., Cincinnati, Ohio.

OLD COMBS WANTED—Our steam wax presses will get every ounce of beeswax out of old combs, cappings or slumgum. Send for our terms and our 1925 catalog. We will buy your share of the wax for cash or pay you a little more in exchange for foundation or supplies. Dadant & Sons, Hamilton, Ill.

FOR SALE

400 clean 60-lb. cans and cases to exchange for honey. H. Wittmann, Lincoln, Nebr.

MAKE queen introduction SURE. ONE SAFIN cage by mail, 25c; five for $1.00. Allen Latham, Norwichtown, Conn.

FOR SALE—Root 8-frame power extractor and gas engine, practically new. A. G. Woodman Co., Grand Rapids, Mich.

FOR SALE—Two-frame, hand-reversible extractor and supplies. Good as new. Write if interested. Sherrill Halbert, Terra Bella, Calif.

FOR SALE CHEAP—Good 60-lb. honey cans, two to case, used once. S. T. Fish & Company, 163 W. South Water St., Chicago, Illinois.

FOR SALE—New Root extractor, two large reversible pockets, $25.00; ten hives, $25.00. Harvey Barrett, 2031 W. 45th St., Cleveland, Ohio.

FOR SALE—140 cases of nice second-hand 60-lb. cans, two cans to the case, 50c per case, f. o. b. Never were in water. Wm. C. Brown, 809 Maple St., Battle Creek, Mich.

TRY REXFORD'S Push-in-Comb introducing cage. Safe, automatic. No opening hive necessary after queen is in. Room for all combs. 35c, 3 for $1.00. O. S. Rexford, Winsted, Conn.

FOR SALE—4-H. P. engine in good working order. Will do the work of a new one. 30 cases of good 60-lb. cans, cleaned, washed, dried, 40c a case. J. W. Utter, Pine Island, N. Y.

FOR SALE—200 new ten-frame cypress hive-bodies with Hoffman frames, corners halved, K. D., $1.25 each; lots of 50, $1.00 each. The Silsbee Apiaries, Bath, R. F. D. No. 1, N. Y.

FOR SALE—Good second-hand 60-lb. cans, two cans to a case, boxed. We have large stocks of these on hand. Please write for prices if interested. We are offering only good cans and good cases. C. H. W. Weber & Co., Cincinnati, Ohio.

BIG BARGAIN—Retiring, no bee pasturage left, no disease. $60.00 whole outfit. 18 8-frame painted hive-bodies, complete with frames and combs; 10 supers and fittings; 150 boxes put together and foundation; 2-frame Novice extractor; 1 smoker; gloves, veils, foundation; 10 bee-feeders; 2 bee-escapes; 10 queen-excluders. Charles W. Ruppe, 46 Sherwood Ave., Yonkers, N. Y.

BARGAIN IN ROOT'S GOODS. Clean stock. Packages just a little shopworn. Jumbo Hoffman frames, $5.20 per 100; shallow frames with corner-cut top-bar, $4.40 per 100; eight-frame shallow extracting supers, with frames, $4.20 for five; eight-frame bottom-boards, $2.55 for five; eight-frame inner covers, $2.70 for five; 10-frame supers for 4¼x1½ sections, $1.05 each; 30 10-frame supers for 4¼x4¾ sections, 50c each. The Stover Apiaries, Tibbee, Miss.

BEES AND QUEENS

WHOLE colonies of bees, if advertised for sale in these columns, must either be guaranteed free from disease, or, if not so guaranteed, the exact condition of the bees and the conditions of sale must be clearly stated in the advertisement; or, it will be satisfactory if the advertiser will agree to furnish a certificate of health from some authorized bee inspector at time of sale.

HARDY Italian queens, $1.00 each. W. G. Lauver, Middletown, Pa.

SIX 8-frame colonies, $6.50 each. Guaranteed no disease. W. J. Shafer, Glenford, Ohio.

PACKAGE BEES—Reduced prices. Van's Honey Farms, Hebron, Ind.

YOU will be pleased with my queens. Write for June prices. R. V. Stearns, Brady, Texas.

30 COLONIES of bees, guaranteed free from disease. Oliver Smith, Route 38, Anglum, Mo.

THREE-BANDED Italian queens—1, $1.00; 6, $5.00; 12, $10.00; 100, $75.00. G. E. Whittle, Mussel, Alabama.

HIGH GRADE ITALIAN QUEENS. Bees are gentle and will do the work. $1.00 each; 6 for $5.00. J. J. Scott, Crowville, La.

LEATHER-COLORED Italian queens, $2.00 until June 1; after, $1.00; tested, $2.00. A W. Yates, 15 Chapman St., Hartford, Conn.

THREE-BAND ITALIAN QUEENS. 1 select untested, $1.00; 12 select untested, $10.00; 1 select tested, $1.50. J. Allen, Catherine, Ala.

BRIGHT Italian queens, 1, $1.00; 12, $10.00; 100, $75.00. Write for prices on package bees. T. J. Talley, Greenville, R. F. D. No. 3, Ala.

FOR SALE—Four colonies Italian bees, double-walled Jumbo hives. Guaranteed free from disease. T. H. Hansen, 1503 Min. Pt. Ave., Janesville, Wis.

SHE-SUITS-ME queens. Untested 3-banders, $1.00 each; 25 or more ordered in advance, 75c each. Safin cage with initial order. Allen Latham, Norwichtown, Conn.

GOLDEN ITALIAN queens, producing large beautiful bees, solid yellow to tip. Package bees, nuclei circular. 1925 ready, free. Dr. White Bee Co., Sandia, Texas.

SELLING out 350 colonies of bees and equipment. In good condition. Guaranteed disease-free. In good orange section. Never had a crop failure. Cassia Apiaries, Cassia, Fla.

ONE 2-lb. package bees, with queen, $3.75; 3-lb., $4.50. Larger the order better the price. Tested queen, 50c extra. Established in 1909. Have no disease. F. M. Morgan, Hamburg, La.

GOLDEN ITALIAN queens for sale, 1, $1.00; 6, $5.00; 12, $10.00; 100, $75.00. Package bees in season. 20 per cent to book your order for spring delivery. J. F. Rogers, Greenville, R. F. D. No, 3, Ala.

CITRONELLE QUEENS—If you have not tried them, send 50c for a sample queen. They are good Italian stock and fine honey-gatherers. See our large advertisement on page 478. The Citronelle Apiaries, Citronelle, Ala.

GOLDEN ITALIAN QUEENS—Untested, $1.00; 6 for $5.40; 12 or more, 80c each. Tested, $1.50; select tested, $2.50. Apiary inspected by state inspector; no disease found. Safe arrival and satisfaction guaranteed. D. T. Gaster, R. F. D. No. 2, Randleman, N. C.

GOLDEN Italian Queens for 1925, the big, bright hustling kind (the kind that gets the honey). Satisfied customers everywhere. Untested, 90c each; 6 for $4.50; 12, $9.00; 100, $70.00. Tested, $1.50 each. Safe arrival guaranteed. E. F. Day, Honoraville, Ala.

THREE-BANDED stock, queens, $1.00 each; 6 for $5.00; 12 for $9.00. All rush orders sent to Walker & Son, Vidalia, Ga., Box 354, from now on. Curd Walker, Jellico, Tenn.

LEATHER-COLORED three-band Italian bees and queens bring home the honey and make happy bee men. See our ad on page 482. J. M. Cutts & Son, R. F. D. No. 1, Montgomery, Ala.

C. W. PHELPS & SON are still producing the famous Phelps' Golden Queens. PROLIFIC, GENTLE and very BEAUTIFUL. $2.00 each; 6 for $10.00; $18.00 a doz. C W. Phelps & Son, Binghamton, N. Y.

OUR "AUTAUGA" Italian Queens must please you, else return them. Clean health certificate by state inspector. To July 1, untested, $1.00 each; balance season, 75c. Autauga Apiaries, Autaugaville, Alabama.

FOR SALE—45 colonies pure-bred Italian bees, requeened last fall. New ten-frame standard equipment. 60 supers for comb honey. Guaranteed free from disease. Exceptional bargain. L. J. Smith, Fayette, Ohio.

AGAIN our northern-bred leather-colored Italian bees have wintered fine, and we guarantee that no disease exists in our yards. Queens after June 15, $1.25 each; $12.00 per doz. Charles Stewart, Johnstown, N. Y.

BUY from shipper farthest north. Order now for spring. Three-frame nuclei, with tested queens, $4.50 each. Best stock, no disease. 20 years' experience with satisfied customers. S. G. Crocker, Jr., Roland Park, Baltimore, Md.

FOR SALE—Bright leather-colored queens. Bees none better. Write for prices. Also will have some bees by the pound for sale in 1925. Get price and place orders early to insure getting when wanted. M. Bates, Greenville, R. F. No. 4, Ala.

BRIGHT American Beauty Italian queens and bees. Untested queens, $1.00, 3 or more, 75c each; $8.00 a dozen. Three-frame nuclei, $5.00. Guarantee safe arrival. Tupelo Apiaries, J. L. Morgan, Apalachicola, Fla.

WARRANTED pure-mated Italian Queens, $1.00 each. Will be ready to mail in my sure introducing cages by May 15. No black or hybrid bees around here, so my queens will be mated with pure Italian drones. Daniel Danielsen, Brush, Colo.

IF you want good bright Italian queens by return mail, send your order to us. Queens, 75c each; $8.50 per dozen; one pound of bees, with queen, $3.00; two pounds of bees, with queen, $4.75. We pay charges. Graydon Bros., R. F. D. No. 4, Greenville, Ala.

FOR SALE—Golden Italian queens, untested, $1.00 each; 6 for $5.40; 12 or more, 80c each. Tested, $1.50 each; select tested, $2.50 each. Apiary inspected and no disease of any kind found. Safe arrival and satisfaction guaranteed. Sam Hinshaw, Randleman, N. Car.

HOLLOPETER'S ITALIAN QUEENS. Choice, untested, each, $1.25; 6, $7.00; 12, $13.00. Write for prices on queens for July and August requeening. Pure mating, safe arrival, no disease, satisfactory stock and service guaranteed. J. B. Hollopeter, Rockton, Pa.

PACKAGE bees and three-band Italian queens that please. Our 20 years' experience here in selective breeding of queens and the shipping of bees are at your service. No disease in this section. For prices and reference, write Allenville Apiaries, Allenville, Marengo Co., Ala.

FOR SALE—Golden Italians bred for all the good qualities bees should possess, as well as for color. Queens only. Untested, $1.00 each; 6 for $5.25; 12 or more, 75c each. Postpaid and safe arrival insured. State certificate of health included. Hazel V. Bonkemeyer, Randleman, R. F. D. No. 2, N. C.

OPPORTUNITY—60 or 70 colonies of bees complete with all equipment. Guaranteed free from foul brood. Good river range and plenty of it. Good fishing, healthy climate, good schools. Price $500 for lot and equipment, with terms to right party. Communicate with Adolph Daniel, Warren, Ark.

FOR SALE—Three-band Italian queens that produce hardy and gentle bees, the kind that get the honey. Untested, 80c each; 6 for $4.75; 12, $9.00. Tested queens, $1.50 each. Queens in larger lots for requeening, write for prices. Safe arrival and satisfaction guaranteed. Robt. B. Spicer, Wharton, N. J.

MAJOR'S Improved Italian Queens. We are using a breeder from a colony that made 520 pounds of honey last year. We are filling orders by return mail. Queens in my push-in-the-comb cage, $1.25 each; queens in the regular mailing cage, $1.00 each. H. N. Major & Co., South Wales, N. Y.

SUPERIOR THREE-BANDED LEATHER-COLORED ITALIAN QUEENS BY RETURN MAIL. Selected untested, 1-9, 65c; 10-49, 60c; 50 and up, 55c. Selected tested, 1, $1.25; 12, $12.00. Guarantee safe arrival, satisfaction, no disease, ship only the best. Queens to please or your money back. W. C. Smith & Co., Calhoun, Ala.

FOR SALE—Choice bright Italian queens. I have been building up this strain for the last 21 years for vigorous hustlers, good winterers, gentleness and fine color. These queens will equal the best on the market. Health certificates go with queens. Prices: 1 untested queen, $1.25; 12 untested queens, $12.00; 1 breeder, $5.00. Emil W. Gutekunst, Colden, N. Y.

ITALIAN QUEENS—W. A. Arnold & Son, Angola, Ind., write: "The 40 queens bought of you last season are doing fine. They head the best colonies we have." No better queens can be found. One, 80c; doz., $9.00; 25, $17.50. Virgins, 30c. STATE INSPECTED. Perfect satisfaction guaranteed. CRENSHAW COUNTY APIARIES, Rutledge, Ala.

CAROLINA QUEENS—It has taken me years to produce a strain of bees on which I can give an absolute guarantee of perfect satisfaction. They are gentle, prolific, and excellent producers. Untested, $1.00 each; 12 for $10.00; $65.00 per 100; tested, $2.00 each; select tested, $2.25. A trial order will convince you. Carolina Bee Co., W. O. Curtis, Mgr., Graham, N. C.

THREE-BANDED Italian queens. Every queen guaranteed a good queen. Warranted purely mated. Tested in May and June, $2.00 each. After June, $1.50. Untested in June, 1, $1.25; 6 for $7.00; 12 for $13.00. After June, 1, $1.00; 5, $5.00; 12, $10.00; 100, $75.00. If a colony goes through winter queenless it will not pay to give them a queen. Better unite it with another. J. F. Diemer, Liberty, Mo.

ON receipt of order—a one-frame nucleus with two pounds bees and a select untested queen, 1-25, $3.25 each; 25 or more, $3.00 each; each additional pound bees, add 70c; additional frame of brood, 60c. Select tested queens, add 75c; one select untested queen, $1.00 each; 25 or more, 90c each. We guarantee safe delivery and a health certificate with each shipment. Reference, Avoyelles Bank, Moreauville, La. C. A. Mayeux, Hamburg, La.

ITALIAN QUEENS—After 14 years of careful selection and breeding we have produced a strain of three-banded Italians that are superior to many. The gentle kind. Am breeding from the colony that produced eight complete ten-frame supers of fancy comb honey in 1924 without swarming. Am offering this strain at the following prices: Untested, 1, $1.00; 12, $10.00; 100, $85.00; tested, $1.50 each. Breeders, $5.00 each. Never had disease. Geo. Morrison, Box 65, Mandale, Ohio.

FOR SALE—During the month of August I am going to offer for sale tested Golden Italian Queens at $2.00 each. These queens are extra good quality and sure to please. Satisfaction guaranteed. Let me have your order now and say what date you want shipment made. J. F. Michael, Winchester, R. F. D. No. 1, Ind.

FOR SALE—600 colonies of bees, half in ten-frame Buckeye and balance in single-walled hives, mostly two-story equipment, besides 1200 comb-honey supers and a quantity of extracting supers, eight-frame reversible extractor, gas engine, tanks and Oldsmobile truck. All our bees for sale guaranteed free from disease. Two-story bee house 28x40 feet, with water, gas and electricity. Home with one acre of land in town of 1500 people, six rooms and bath, with furnace, gas and electricity. H. E. Crowther, Jefferson, Ohio.

WANTS AND EXCHANGES

WANTED—Two-frame extractor. State condition. G. Korn, Berrien Springs, Mich.

WANT July or August package bees, colonies or equipment for good interest in Minnesota land, forty or quarter. A. M. Wise, Appleton, Minn.

SITUATION WANTED

TWENTY years' experience. Go anywhere for good salary. Good character. L. L. Ferebee, Bluffton, S. C.

MISCELLANEUS

WONDERFUL collection of beekeeping literature for sale. Will sacrifice. Write for particulars. Louis A. Loboda, 1301 Fifth Ave., Milwaukee, Wis.

RARE and ancient bee books for sale. The old-timers' study of your industry through 300 years. Instructive and of absorbing interest. John E. Miller, Spuyten Duyvil, New York City.

THE BEE WORLD—The leading bee journal in Britain and the only international bee-review in existence. It is read, re-read and treasured. Will it not appeal to you? Specimen copy free from the publishers. Send us a postcard today. It is well worth your little trouble. The Apis Club, Benson, Oxon, England.

TOO LATE FOR CLASSIFICATION.

FOR SALE—Amber honey in 60-lb. cans and barrels, 7c per pound. Sample, 15c. R. L. Tucker, Uniontown, Ala.

FOR SALE—In 120-lb. cases of two cans, best quality white sweet clover honey from Cochrane, Ala., or western Iowa. $13.20 per case f. o. b. Joe C. Weaver, Cochrane, Ohio.

A SPECIAL BARGAIN.

We have a few of our regular metal signs which are slightly imperfect and for which we make a special price while they last. The color of the sign is a deep yellow, with the words "Honey for Sale Here" and the border in black, printed on both sides. They measure 14 x 18 inches, and have a two-inch flange for fastening to a support. Nothing wrong with them except that the enamel is cracked and loosened at the point where the flange is turned. Regular price is 90c, not postpaid. Special price is 50c, not postpaid. Better order at once.

The A. I. Root Company, Medina, Ohio.

Honey Sells Itself

---If properly displayed in glass jars having no panels to shadow and darken the contents.

Thousand of tourists this summer will be supplied from roadside stands with honey in

HA STANDARD HONEY JARS

Insist upon HA Glass Jars

Let our HA Honey Jars be your Silent Salesmen

Order through our distributors or our main office.

DISTRIBUTORS

The A. I. Root Company, Medina, Ohio
Hoffman & Hauck, 1331 Ocean Avenue, Woodhaven, N. Y.
A. G. Woodman Co., Scribner Ave. and Blumrich St., Grand Rapids, Mich.
The A. I. Root Company of Iowa, Council Bluffs, Iowa

HAZEL ATLAS GLASS CO.

DESIGNERS AND MANUFACTURERS

WHEELING, W. VA.

New England

Beekeepers will find a full line of supplies here. We can save you time and money, and solicit your orders.

Send for new catalog.

H. H. JEPSON

237 Park St. Medford 55, Mass.

MACK'S QUEENS

Win the admiration of all those who use them. A trial order will convince you also. Select Untested only $1.00 each; $10.00 a dozen; $75.00 per hundred. Every queen guaranteed perfect and to give complete satisfaction. Booking orders now.

HERMAN McCONNELL

(The Bee and Honey Man)
ROBINSON, ILLINOIS.

"We've Got It"

And we promise 24-hour service, too. Large and complete stocks of Root Guaranteed Quality Supplies.

FOLSLAND BROTHERS

OLDHAM, SOUTH DAKOTA.

SERVICE -- QUALITY

Thousands of Select Three-banded Italian Queens Ready for Prompt Shipment.

28 Years of select breeding gives us bees that are hardy and long-lived. They have proved themselves unexcelled for gentleness, disease-resisting qualities, and honey production. "Nuff said."

Sel. Untested queens, one grade only, 75c each; $8.00 per dozen.

Sel. Tested queens, one grade only, $1.50 each; $16.00 per dozen.

Safe arrival and satisfaction we guarantee. Let us quote on your large demands for fall requeening. Circular price list on request. Wings of queens clipped free of charge when desired.

M. C. BERRY & COMPANY

BOX 697. MONTGOMERY, ALA.

QUEENS, 60 cts.

$7.00 a Dozen

Pure three-banded Italian Queens. Dependable, reliable. Bred by long experience and careful breeder from selected stock. Do not let the price confuse you, for every queen is absolutely guaranteed. Inspected by State inspector.

G. H. MERRILL APIARIES

Piedmont, S. C.

QUALITY BREEDING QUEENS

Our breeding queens have been carefully selected and tested, are very prolific, uniformly marked, vigorous, and hardy, at only $5.00, guaranteed to please. We believe our breeding queens to be as good as any $10.00 or $25.00 queens. Very selected tested queens, $3.00. Selected Tested queens, $2.00. Three-banded or extra yellow golden.

A one-frame nucleus with two extra pounds of bees with a choice breeding queen, $6.00, or with very selected queen, $4.00; with selected tested queen, $3.25.

We take this opportunity to thank our many friends for generous response to our efforts. In early spring we were overwhelmed with orders from United States, Canada, Cuba, even Mexico. Safe delivery guaranteed.

The Louisiana Modern Apiaries

BUNKIE, LOUISIANA.

"NO SLEEP"

No, we don't sleep until orders are all out. And from large stocks of Root Guaranteed Quality Supplies, you can get just what you need here at

THE DEPOT BEE YARD

HERSCHEL SHORT

ALTOONA, KANSAS

"Honey Girl" Queens 100 for $80.00

When you need a queen that is a queen, order a "Honey Girl" Italian Queen. Value of orders delivered and booked in advance for delivery before July 1st is more than double the value of sales for whole season of 1924. We wish to thank our friends for their valued orders and kind recommendations.

Price List: Untested, 1, $1.25; 10, $10; 50, $45.00; 100, $80.00; 250 or more, 75c each. Select untested, add 10c per queen. Tested queen, $2.00; select tested, $5.00.

Honey Girl Apiaries, Hamburg, La.

RUSSELL'S SUPERIOR QUALITY QUEENS

As we have discovered the secret of mating queens to choice drones, we believe we are justified in saying "SUPERIOR QUALITY" QUEENS. 25 years' experimenting has brought us to the position where we can give you the very best obtainable in three-band bees. No order too large, none too small. Guarantee safe delivery. Free from disease. We never had a diseased colony in our yards.

QUEENS, $1.00 each in April; May, $1 each, 3 for $2.00. Quantity orders, 100 for $65.00. Breeders, $10.00.

The Russells' hives are crowded,
The Russells' hives are jammed.
The bees that fill the supers
Are from the F. M. Russell strain.

F. M. Russell Co., Roxbury, Ohio

Root QUALITY BEE SUPPLIES

WE HAVE TRIED TO ANTICIPATE YOUR BEE-SUPPLY NEEDS AND HAVE ON HAND A CARLOAD OF ROOT'S GOODS. ORDER FROM US AND SAVE FREIGHT.

24-HOUR SERVICE.

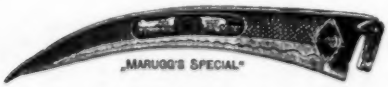
THE SCHENECTADY BEE SUPPLY CO.

242 Union St., Schenectady, N. Y.
Telephone 313R.

Lewis Beeware
Dadant Foundation

BIG STOCK
ORDER NOW

John N. Prothero
Dubois, Pennsylvania



The Apiarist's Friend.

GERMAN SCYTHES AND SICKLES, with "Dangel" cutting edge, permit cutting of grass in the apiary with minimum disturbance of the colonies. Catalog on request.
The Marugg Co., Dept. B, Tracy City, Tenn.

(Continued from page 424.)

GRAND VALLEY, COLO.—With a few exceptions colonies are in better condition than at this date last year. The season is about a week earlier. Showers during the past week have put honey plants in good condition. However, many localities on the western slope are facing another shortage of irrigation water which will undoubtedly reduce the honey crop. Some beekeepers report considerable swarming. All 1924 crop honey sold.

The Western Colorado Honey Exchange,
Jas. Watson, Jr., Mgr.
Grand Valley, Colo., June 10.

DENVER, COLO.—Northern Colorado from Denver to the Wyoming line: Crop prospects are very poor. Very little rain for months and shortage of irrigation water causes lack of nectar-producing flora. Many colonies of bees have been moved out of this territory of late. Arkansas Valley: Some shortage of irrigation water in this district. Prospects are for a fair crop. Western Slope: No lack of moisture and prospects for a honey crop are fair to good. Wyoming: Crop prospects are fair to good. Montana: Crop prospects are fair to good. Inquiry for white extracted honey; none to supply in carlot.

The Colorado Honey Producers' Association,
F. Rauchfuss, Sec.
Denver, Colo., June 15.

The A. I. Root Company's Report.

Since our last report we have received one car of mesquite extracted honey from Arizona for which we paid 8c for white and 8½c for water-white f. o. b. shipping point, and 1320 lbs. of Michigan white clover at 10c per pound f. o. b. shipping point.

Big, Bright Northern-bred Italian Queens

Bred for beauty, gentleness, and honey-gathering qualities. Delivery begins June 1. Untested, $1.00 each.

M. P. LeMUNYON, R. D. 3, Cassopolis, Mich.

NEW CATALOG READY
BEEKEEPERS' SUPPLIES
Root's Goods of High Quality.
Three-ply foundation, standard stock of supplies kept on hand for prompt shipments. Send us your inquiries and orders early for quick action.
J. NEBEL & SON SUPPLY CO.
Montgomery County High Hill, Missouri

Letterheads & Envelopes

Your personal representatives—we make them look attractive. Try us. Send for free sample book.

The A. I. Root Company
WEST SIDE STATION,
MEDINA, OHIO.

SOUR HONEY DEPT.

I am surrenderin the Sour Honey Dept. to my friends this hot month. I aint got no ambishon with the fishin poor and trappin season so far off and my bees loafin too.

Mr. W. E. Reim up at Hustisford, Wis., writes some sense as follows on the subject of Bee Talks. He says:

BEE TALKS

Of late so many bee and honey talks have been broadcasted that radio instruments are becoming sticky and will soon begin to ooze honey. Listeners should be advised to have a sharp needle handy and punctuate their face, hands, and other tender parts of their body at every interesting statement so as to more fully realize the joys of beekeeping.

If, as is to be expected, the consumption of honey will keep pace with these lectures our bees will soon be obliged to work overtime to supply the demand. And if, in addition, the listeners could see the kindly face of Dr. Phillips, or the ecstatic honeylike smile of Mr. Demuth, or the solemnly determined countenance of Mr. Hambleton, it would create such a demand for honey that we poor beekeepers would soon be compelled to press bumblebees and hornets into service to furnish the goods.

So you better stop kicking and underselling your competitor and whining about poor markets and oversupply. Get busy, roll up your

(Continued on page 479.)

NEWMAN'S QUEENS

are absolutely first quality and fully guaranteed. Satisfaction and safe arrival. Untested, $1.00; 6, $5.00; 12, $9.00. Select Untested, $1.25; 6, $6.00; 12, $11.00. Circular free.

A. H. Newman, Queen-breeder, Morgan, Ky.

HONEY PAILS

MANUFACTURERS OF
"BLOSSOM-SWEET"
AND
BADGER BRAND
5 and 10 lb. Honey Pails.

We specialize in 5 and 10 lb. round pails and 60 lb. square cans. Plain and Lithographed cans of all descriptions.

WILKES-BARRE CAN CO.
ESTABLISHED 1856
WILKES-BARRE, PENNA.

Queens 60c *By Return Mail*

Hundreds of No. 1, first-class queens for June and July delivery. These queens will be reared from a natural honey flow from clover. It doesn't cost anything but our labor. That is why we can offer them so cheap. No black bees within five miles of mating yard. Untested queens, 60c each; select untested queens, 70c each; 2-lb. package, $3.50 each; 3-lb. package, $4.50 each, queens included, shipped by express only.

We guarantee pure mating, safe arrival, free from diseases, and satisfaction in U. S. A. and Canada.

MONTGOMERY CO. APIARIES
NAFTEL, ALABAMA.

—QUEENS OF—

Moore's Strain

OF ITALIANS PRODUCE WORKERS
That fill the supers quick
With honey nice and thick.

They have won a world-wide reputation for honey-gathering, hardiness, gentleness, etc.

Untested queens, $1.00; 6, $5.00; 12, $9.00. Select Untested, $1.25; 6, $6.00; 12, $11.00. Safe arrival and satisfaction guaranteed. Circular free.

J. P. MOORE, QUEEN BREEDER,
Route 1, Morgan, Kentucky.

Queens 70c

BY RETURN MAIL

Mr. Beekeeper, why can we offer you good queens so cheap? Because basswood and clover are in full bloom, turning out nectar by the barrel. All of our colonies are boiling over with bees and all of our nuclei in full operation, turning out queens every day as fine as you ever saw. Now is your time to head your colonies with a good queen at a low price. These queens are as good as others that are selling for twice the money and will make you just as many pounds of honey. You take no risk in buying NORMAN BROS.' 3-banded Italian queens and bees. If you are not satisfied with them, just return them and we will replace or refund your money. All orders filled by return mail or soon thereafter. All orders for package bees we ship the day you name, by express only.

PRICES FOR JUNE AND JULY

Untested queens—1, 70c; 6, $4.00; 12, $7.75; 50, $30.00. Select untested—1, 80c; 6, $4.50; 12, $8.50; 50, $35.00. Tested queens—1, $1.35; 6, $7.50; 12, $13.50. Select tested—$1.50 each. One 2-lb. package with select untested queen, $3.50 each; 12 or more, $3.25 each. One 3-lb. package with select untested queen, $5.00 each; 12 or more, $4.75 each.

We guarantee pure mating, safe arrival, free from disease, and satisfaction, in U. S. A. and Canada.

NORMAN BROS.' APIARIES, NAFTEL, ALA.

Long-Lived Bees Are Profitable

I know that my principal breeder queen is not less than four years old and still going strong. Get prices of her daughters.

R. V. Stearns, Brady, Tex.

Package Bees

Hardy Northern Bees

July and August Sale

2-pound package with queen at $4.00
3-pound package with queen at $5.00

Safe arrival and satisfaction guaranteed.
Illustrated circular free.

Van's Honey Farms, Hebron, Indiana

Leininger's Strain of Italians

We have been queen-breeders for nearly 50 years. In all this time we have tested nearly every strain of Italian bees in the U. S. A. By this careful selection and breeding we have succeeded in producing a strain of bees surpassed by none but superior to many, bees that are gentle and great honey-gatherers.

Therefore if you buy queens from us you may be assured that back of them are nearly 50 years of careful breeding for the production of honey.

As we are located in a red-clover belt, it is but natural that our bees should have a long-tongue reach.

We will sell queens from this superior strain as follows: Untested, 1 to 5, $1.00 each; 6, $5.50; 12, $10.50; 100, $85.00. Tested, $1.50 each; select breeders, $5.00 to $10 each

Safe arrival and satisfaction guaranteed.

Fred Leininger & Son, Delphos, Ohio

Substantial Reduction in Prices

With the same standard of Quality and Service

One Untested Italian Queen, 65c; 10 or more, 60c each.
Tested Queens, $1.50 each.

Safe arrival and satisfaction guaranteed

JOHN C. HOGG, RAMER, ALABAMA

QUEENS -:- $60.00 PER 100 -:- QUEENS

PRODUCTION-BRED ITALIANS

Reduced Prices after July 1: 1 to 50, 75c each; 50 to 100, 60c each.

Requeening time is near at hand. Here is an opportunity to get some fine young queens from a honey-producing strain, into your colonies at prices you can afford to pay. I guarantee them to be first-class, no culls, and to please you in every way or money refunded. Can we place your name on our list of satisfied customers?

Connecticut Valley Apiaries, A. E. Crandall, Berlin, Conn.

(Continued from page 477.)

sleeves, and help to make this the banner year in production as well as consumption. Do something to promote the health of your country by supplying one of the best food products in the greatest possible quantity, and incidentally cure your pocketbook of that lean and hungry look. W. E. Reim.

Mr. Reims is right all together only Doc. Phillips aint got any such face as he puts on him. You just see Phillips' face some time when some feller don't agree with him and claims he hisself knows somethin about beekeepin as well as Phillips. You'll see a fashal hornet's nest, that's what you'll see.

* * *

John R. Gary, of Cairo, W. Va., takes his pen in hand and writes about Californy mostly. He also wrote a lot about

(Continued on page 481.)

Queens---Rhode Island---Queens

Italian Northern-bred queens. Very gentle and hardy. Great workers. Untested, $1.00 each.
Queens delivered after June 1.
O. E. TULIP, ARLINGTON, RHODE ISLAND.
56 Lawrence Street.

Carniolans

carefully bred show the following desirable traits to a high degree: They are very gentle, very prolific at all times, build very white combs, are most excellent workers, resist brood diseases as well as any bees and do not swarm excessively if intelligently managed. My paper, "MERITS OF THE CARNIOLAN BEE," describes Carniolans more fully and outlines successful plans of managing these bees. Free for the asking.

I supply Carniolans of my own strain, 13 years selection and breeding, and the Jan Strgar and M. Ambrozic imported strains. Breeders imported 1924.

ITALIANS

I am rearing Italian queens 12 miles from Carniolans, C. B. Hamilton strain. The mother of this breeder produced 577 sections of comb honey.

1 untested queen, Carniolan or Italian..$ 1.10
12 untested queens, Carniolan or Italian 12.00
Tested queens, Carniolan or Italian..... 2.25

During July, at the close of the white-honey flow, is the best time to requeen in the northern states. Safe arrival and satisfaction guaranteed.

ALBERT G. HANN
GLEN GARDNER, NEW JERSEY.

LOCKHART'S SILVER-GRAY CARNIOLANS

Forty-two years of experience breeding this wonderful race of bees; 38 years a breeder and importer of queens. They are very hardy, gentle, prolific, great workers and builders of very white comb; use mostly wax in place of propolis. Not inclined to rob like Italians; winter extra well and build up quickly in spring. Prices of queens for July to November: Untested queens, $1.00; 6, 95c each; 12, 90c each; 25, 80c each; 50 or more, 75c each. Select Untested Queens, $1.50 each; 6, $1.45 each; 12, $1.40 each; 25, $1.25 each; 50 or more, $1.00 each. Tested Queens, $3.00 each. Select Tested, $5.00. Breeders, $10.00 to $25.00. Safe arrival and satisfaction guaranteed in U. S. and Canada. No foul brood here.

F. A. LOCKHART & CO., LAKE GEORGE, NEW YORK

4% BANKING BY MAIL

EVEN IF YOU LIVE thousands of miles from Medina you can open a 4 per cent Savings Account with this bank. $1.00 starts an account.

THE HOME OF THE HONEY BEE

THE SAVINGS DEPOSIT BANK CO. MEDINA OHIO.
E. B. SPITZER, PRES. E. R. ROOT, VICE PRES. H. E. AYLARD, CASHIER

Time to Re-queen with Line-bred Imported Italians

Untested queens: 1-5, $1.00; 6-11, 85c ea.; 12 up, 75c ea.

The V. R. Thagard Co.
Greenville, Alabama

OUR DARK IMPORTED THREE-BANDS WERE IMPORTED DIRECT FROM ITALY. LINE-BRED. MONEY-MAKERS. THEY'VE MADE GOOD WITH THOUSANDS OF THE BEST BEEKEEPERS IN THE WORLD.

"The queen I received from you a few months ago has already stored three deep ten-frame supers."—Theo. L. Green, Opelousas, La.

OUR BEES ARE NOTED FOR THEIR PROLIFICNESS, HONEY-PRODUCING QUALITIES, AND GENTLNESS. CIRCULAR FREE.

QUEENS

SUMMER PRICES, 1925

One Untested, 75c ea.
25 Untested, 70c ea.
50 Untested, 65c ea.
100 Untested, 60c ea.
One Tested, $1.50 ea.
Ex. Sel. Tested, $3 ea.

PURE THREE-BAND ITALIANS

D. W. Howell
Shellman, Georgia

QUEENS

Pure Three-banded Italians
Bred for Business

Our output has been greatly increased. No order too large for consideration, none too small for prompt attention. We strive to excel in queen-rearing and service. No disease.

PURE MATING, SAFE ARRIVAL AND SATISFACTION GUARANTEED

UNTESTED
(CHOICE QUEENS ONLY)

60c each

$55 per 100

Jensen's Apiaries
Crawford, Miss.

Queens for Requeening

FOREHAND'S THREE-BANDS

THE BEST IS CHEAPEST. THEY SATISFY. WHY? BECAUSE A LIFETIME HAS BEEN SPENT IN BREEDING QUEENS OF THE BETTER KIND.

Untested: 1, 80c; 10, 75c ea.; 100, 70c ea.

SAFE ARRIVAL and PERFECT SATISFACTION GUARANTEED IN U. S. and CANADA.

N. Forehand, Gonzalez, Florida

Townsend's Bulletin No. 23

Foretelling the merits of TOWNSEND'S ARISTOCRATS

the bees with a history. Bred in line for 19 years by Miss Flo. Shaw, the lady who put the "line" in the Shaw "line-bred stock" of pure three-banded Italian bees. I have bought and own the entire stock of Shaw bees, owned and bred by her all these years, no other Shaws having bees since the latter part of the eighteenth century. This purchase included all of the old breeding stock, including "Lady Shaw," likely the finest breeding queen ever produced.

Hereafter these bees will be known as **TOWNSEND'S ARISTOCRATS**, they being bred from the cream of all these fine breeders, selected the past three springs by myself with great care and judgment. Do not be satisfied with anything but the best, **TOWNSEND'S ARISTOCRATS.**

I have a fine lot of untested queens from this **ARISTOCRAT** stock that I will offer for July and August mailing for only an even dollar each, or ten dollars per doz. A very low price for **ARISTOCRAT** stock. Queens mailed direct from my breeding yards at Loreauville, La., but you should address me at my home at Northstar, Michigan. E. D. Townsend.

(Continued from page 479.)

religion, but I know the folks out in Californy wont believe he knows anythin about true religion when they read what he says, so I won't print it. But I see some good in what he says about Californy for it may keep some people from pullin up stakes and flivverin out there thinkin they are goin to a earthly paradise on the goldpot end of the rainbow. They aint. They better stay where they are. Mr. Gary writes as follows, to wit:

I have been a beekeeper off and on for a number of years (mostly off) and a subscriber to Gleanings. I am what you would call a backlot buzzer, a spasmodic beekeeper. I can make foundation, too. But please be advised making foundation is like going to see the girls —it is something to learn.

I have made five trips from West Virginia to California, have been over every principal railroad in that state, worked as telegraph operator near Fresno for the Sante Fe, etc. I was in jail only twice while living in California. My wife came in and purchased me back for $20.

(Continued on page 483.)

TENNESSEE
QUEENS OF QUALITY

3-band Italians only. Unt. Queens, $1.00 each; six for $5.00; $9.00 per doz. Pure mating and entire satisfaction guaranteed.

J. I. BANKS, DOWELLTOWN, TENN.

Italian Queens
By Return Mail

Prepare for next year's honey crop by requeening your colonies now with our high-grade Italian queens. Safe arrival and fullest satisfaction guaranteed.

SELECT UNTESTED

1 to 4, $1.00 each; 5 to 9, 90c each; 10 or more, 80c each.

Frank Bornhoffer
Tobasco, Ohio

Thrifty Queens
50c Each
in lots of 10 or over.

Smaller lots, 60c each

We can make prompt shipment.

Safe arrival is guaranteed in the U. S. and Canada. Pure mating and satisfaction the world over.

Thirty-three years of careful breeding assures you of good queens. An output of thousands of queens per month insures you of the best delivery.

Wire us your rush orders.

W. J. Forehand & Sons
Fort Deposit, Alabama

Requeen with
Hollopeter's
QUEENS

A HUSTLING STRAIN OF LIGHT-COLORED THREE-BANDED BEES BRED FOR BUSINESS

We guarantee pure mating, safe arrival, no disease, satisfactory stock, with prompt service. Orders large and small receive prompt attention.

Prices June 1 to November 1: Select untested, each, $1.25; 6, $7.00; 12, $13.00; 25, $24.00; 50, $45.00; 100, $80. Write for prices on quantity lots for requeening.

J. B. HOLLOPETER
ROCKTON, PA.

Q-U-E-E-N-S

Queen-rearing is now going on "ahummin'" at Vincennes, and we never have turned out as high-grade queens as this year. We are using several breeders that are very prolific, whose bees are very yellow, gentle, and good honey-getters. In addition we still have Queen Alice, our three-banded wonder who is now going strong in her ninth year. She has never swarmed, although run for comb honey, and her bees are so gentle that no smoke is needed when opening the hive.

Write for our Twenty-fifth Anniversary Catalogue, which gives full particulars regarding our stock.

Prices for Remainder of the Season.

One to four inclusive, $1.50 each; five to nine inclusive, $1.45 each; ten to twenty-four, inclusive, $1.40 each; twenty-five to forty-nine, inclusive, $1.35 each; fifty to seventy-four, inclusive, $1.30 each; seventy-five to ninety-nine, inclusive, $1.25 each; one hundred or more, $1.20 each. Breeding queens, guaranteed service for the season, $10.00 each. Our book, "Queen Rearing Simplified," $1.25, postpaid. Jay Smith Push-in Introducing Cage, 35c each, postpaid.

Jay Smith

Route Three, Vincennes, Indiana

To the Beekeepers of Vermont

Root quality Bee Supplies in stock. Prompt service with a short railroad haul saves time. Your patronage solicited.

F. D. MANCHESTER, Middlebury, Vermont.

Mott's Northern-bred Italian Queens

Select untested, till June 1: $1.25; $1.00 each thereafter. Select, guaranteed pure-mated, $1.25 each. Select tested, $2.00. Virgins, 50c. No disease. Satisfaction and safe arrival guaranteed. Canada borders Michigan on the east and north. Save long trips. All selected stock.

E. E. Mott, Glenwood, Mich.

Three-Banded Italian Queens a Specialty

QUEENS BY RETURN MAIL

We have over 1200 Nuclei in operation to handle your rush orders. Send us your order and your queens will go out by return mail.

Read what others say about my queens: "One pound packages headed with your queens gave me a surplus of 150 pounds of extracted honey on a poor honey flow here. I have never had pound packages do well before and I have had lots sent up from the South. Your queens are wonderful producers." Name on request.

Pure mating, prompt delivery, and safe arrival guaranteed. Wings clipped free of charge on request.

Hayneville Apiary Co.

HAYNEVILLE, ALABAMA.

Prices Reduced

We have reduced our prices on our famous red-clover strain of three-band Italians. Our queens have given universal satisfaction since they have been on the market. Repeated high production records prove their superiority.

1 untested, 80c; 12 or more, 75c each; 100 or more, 65c each.

No disease, safe arrival, and satisfaction guaranteed. GIVE OUR QUEENS A TRIAL. THEY MUST MAKE GOOD OR WE WILL. Write for circular.

J. M. Cutts & Son

R. F. D. 1, MONTGOMERY, ALA.

(Continued from page 481.)

I guess a good husband is worth about that much.

California is God's country, but the Devil has it in his possession through the real estate agents. It has the climate and fruit, but when you say that, you had better quit. They have floods in California same as everywhere, and I have seen as hard electric storms in California as I ever saw in West Virginia. The wind, too, has some velocity when it will blow the bricks off the chimneys. They have the flies and the fleas out there. When you buy shares in a water right in California it only entitles you to the privilege of using it. You pay for the water extra. But once "under the ditch" and you are always under the ditch. It is perpetual regardless of whether you use the water or not. You are compelled to use fertilizers as the continual irrigating leaches the elements out of the soil, which is of decomposed granite or volcanic ash. All the coal that California uses comes from British Columbia or New Mexico and you pay 80 cents a bushel for it, and a gunny sack of wood will cost you from 40 to 60 cents. California is all right if you have plenty of money, but in California I busted. If you contemplate going, get a round trip ticket, for it is not all sunshine, and please don't forget pneumonia is as fatal in California as tuberculosis is in West Virginia. You can live in California with consumption for years, but if you

(Continued on page 485.)

Three-Banded Leather-Colored

Italian queens. Untested, balance of season, 90c each; 6 for $4.75; 12 for $9.00, or 100 for $65.00. I guarantee pure mating, safe arrival, and satisfaction.

G. A. TAYLOR, BOX 9, LUVERNE, ALA.

Queens That Are Queens

ITALIANS

We have them and are now prepared to offer them to the beekeepers in quantity lots. We have been producing large crops of honey for 25 years and have reared thousands of queens and have stock that we believe is excelled by none. Try one or a dozen and you will want more. They get the honey. We want to show you.

1	select untested queen	$ 1.00
6	select untested queens	5.40
12	select untested queens	10.20
1	select tested queen	1.75
6	select tested quens	9.00

Queens shipped from Sumterville, Ala.

——Address——

DAVID RUNNING

Filion, Michigan, or Sumterville, Ala.

Achord Queens

Splendid honey-producing Italians. Reared in one of the largest, best-equipped queen-rearing and package-shipping establishments in the South.

Select young laying queens, untested, 75c each, any number. Tested queens, $1.50 each any number.

Promptly mailed to you in large mailing cages with 1925 inspection certificate. Safe arrival guaranteed.

W. D. Achord

Fitzpatrick - - - Alabama

TALKING QUEENS

(They Speak for Themselves)

QUEENS—Untested, each, $1.00; 12 for $10; 100 for $80. Tested, each, $1.50; 12 for $15; 100 for $100. Breeding queens, the best to be had at any price, each, $5.00. Will ship with a nucleus with her own bees for $8.00.

BEES—Two-pound package of bees and queen, each, $3.00; three-pound package of bees and queen, each, $4.00. 5 per cent discount on orders for 100 packages or more. No bees shipped C. O. D. or by parcel post. 10 per cent books your order, balance ten days before shipment. Bees are fed in transit on the best sugar syrup.

There is no disease; health certificate with every shipment. I breed only the light three-banded Italians.

W. H. LAWS

Producer of Bees, Queens, and Honey.

Box 505, Wharton, Wharton Co., Tex.

I have been shipping bees and queens since 1889.

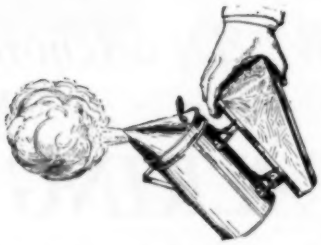
Silver Black Foxes

An interesting and profitable business that combines well with beekeeping or almost any other calling. Ordinary intelligence and a small amount of time required to care for them. We have fully registered foxes to sell for fall delivery, quality equal to any in the world. Foxes will be shipped either from Ontario or Maritime Provinces, as we have interests in both places. Safe delivery guaranteed to purchaser's station; and, if desired, each fox will be scored and accompanied by official score card from the great International authority on foxes, Mr. Geo. Brackett. A fair deal guaranteed and personal references, if asked for, that should satisfy anyone.

As to my responsibility in a commercial way, would refer you to Bank of Nova Scotia, Markham, Ont.

J. L. BYER, MARKHAM, ONT.

Bingham Smokers and Knives



Have been the standard in this and many foreign countries for nearly 50 years. You will find them for sale by most dealers and manufacturers. Insist on the best.

Get our special prices on TIN and GLASS honey packages, shipment from Detroit, Chicago, or Grand Rapids. We have the most complete and desirable line on the market.

A. G. Woodman Co.

Grand Rapids, Mich.

Patents Practice in Patent Office and Court. Pat. Counsel of The A. I. Root Co.

CHAS. J. WILLIAMSON, McLachlan Bldg., Washington, D.C.

World's Best Roofing
at Factory Prices
"Reo" Cluster Metal Shingles, V-Crimp, Corrugated, Standing Seam, Painted or Galvanized Roofings, Sidings, Wallboard, Paints, etc., direct to you at Rock-Bottom Factory Prices. Save money—get better quality and lasting satisfaction.
Edwards "Reo" Metal Shingles
have great durability—many customers report 15 and 20 years' service. Guaranteed fire and lightning proof.
Free Roofing Book
Get our wonderfully low prices and free samples. We sell direct to you and save you all in-between dealer's profits. Ask for Book No 182
LOW PRICED GARAGES
Lowest prices on Ready-Made Fire-Proof Steel Garages. Set up any place. Send postal for Garage Book, showing styles.
THE EDWARDS MFG. CO.
733-783 Butler St. Cincinnati, O.
FREE
Samples & Roofing Book

Three-Ply Root Sections
Airco Foundation
Root Guaranteed Goods

We are prepared with large stocks to give your orders careful and interested dispatch. Of course, the goods ready for you, Root Quality Supplies, are guaranteed to please you in every regard.

Springfield Seed Company

Springfield, Missouri

(Continued from page 483.)
contract pneumonia you are as good as dead in three days.

Well, Mr. Gary, I don't know about Californy myself, but I would guess you would be in jail again if you went out there and they knew you wrote the above. They don't mean to advertise that way so I understand.

* * *

Mell Pritchard is mindin his own business over in the Basswood queen yard raisin queens, so I and he are friends oncet again. Ernie Root is galavantin around the Redpath Chautauqua circle aeratin on bees, and so he too aint botherin me nor that load of uncut slab wood out back of his garage. I have a trade on for a new coon dog so things might be worse with me than they are. Its only because my bees aint gettin no surplus as why I am worryin now.

OLD DRONE.

GOLDEN QUEENS AND THREE-BANDED BEES FOR 1925

Untested queens, $1.00 each. Tested, $1.50 each. 2-lb. package of bees, $3.00; 3-lb. package of bees, $4.50; nucleus, $1.50 per frame. Additional pound of bees with nucleus, $1.00. No disease; safe arrival guaranteed; bees inspected; never had disease.

J. W. SHERMAN, VALDOSTA, GEORGIA.

To New York State Beekeepers

Honey is coming in pretty fast and you are needing supplies.

In addition to the good FREIGHT, EXPRESS, and PARCEL POST service from Syracuse, TRUCKS are leaving Syracuse DAILY, going in every direction. Some of our customers hand the truck driver their orders for supplies with remittance, and have the supplies the same day.

No matter how your order is shipped, every effort is made to get it out the same day as received.

A. I. Root Co. of Syracuse

1631 W. Genesee Street,
SYRACUSE, N. Y.

Serves You Best

Hutzelman's Solution

Has stood the severest tests during the past four years

The Alcohol-Formalin Solution has passed tests where water-formalin solution and other water solutions have frequently failed, because they do not always penetrate sealed larvae. Water will not penetrate propolis.

The cost of Alcohol-Formalin is a small part of the treatment. Only one recurrence after using water-formalin may be enough to offset the extra cost of alcohol-formalin many times over.

Save your infected combs by disinfecting with

Hutzelman's Solution

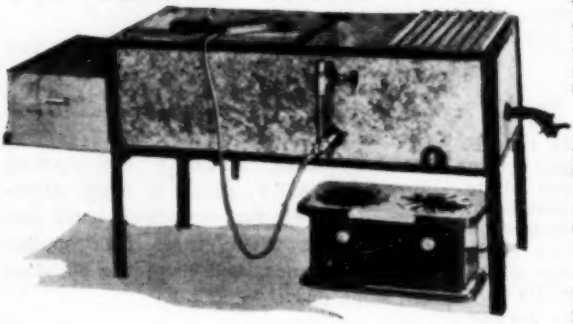
Patented Oct. 14, 1924

This patent covers ALL solutions containing formalin, together with any volatile vehicle, including water.

For full information ask your dealer or write to

J. C. HUTZELMAN, M. D., GLENDALE, OHIO

A New Helper for Beekeepers



(Patent applied for.)

Illustration shows new **6 in 1 Uncapping Stand** invented by an experienced beekeeper. Built by him for his own needs and **combines in one appliance** the many needed. So good every beekeeper should have one.

Below are shown six things it does, and from which it gets name. Replaces extra boiler for heating knife and two machines for liquifying and bottling. Costs less.

Saves every user hours of hard toil. Will do work in more thorough and efficient manner.

ONLY $30.00 COMPLETE

Sells at low price of $30.00—less than all equipment it replaces—direct from manufacturer, F. O. B. Center City, Minn. Guaranteed for satisfaction or money refunded.

1. Uncapping Stand. 2. Steam Generator. 3. Separates Honey from cappings. 4. Melts wax. 5. Liquifies granulated honey. 6. Heats for bottling.

Drains honey from cappings. Machine melts cappings and combs into wax. Double bottom steam generator prevents scorching. Can be used for heating two knives at once. Will liquify granulated honey in cans, pails or jars. Heats honey for bottling. Spigot for pouring into containers. Equipped with two capping baskets.

FULL PARTICULARS FREE—New circular just prepared tells the many things we can't tell in this ad. Tells just how it works and what it does. Pictures describe every part. Just send us a postal today. Please mention this paper when writing.

Bergquist Manufacturing Company, Center City, Minnesota

Beekeepers' Supplies

—o—

Finest Quality
Right Prices
Prompt Service
Courteous Treatment

—o—

We solicit your patronage

—o—

Wm. Baldwin

24 N. Erie St., Toledo, Ohio

Authorized Distributor for THE A. I. ROOT COMPANY.

Better Service for the Buyer of Bee Supplies

is one of the principal aims of our business. We believe, therefore, that our greatest usefulness lies in supplying WHAT you need, WHEN you need it.

We are manufacturers and distributors of just a little better bee supplies, just a little higher grade—SECTIONS, Bee Hives and Frames—in fact, everything the beekeeper needs.

Write for our free illustrated catalog and price list today.

AUGUST LOTZ COMPANY

BOYD, WISCONSIN.

Honey Containers

2½-LB. CANS, PER CARTON OF 100	$4.00
5-LB. PAILS, PER CARTON OF 50	3.50
5-LB. PAILS, PER CARTON OF 100	6.75
10-LB. PAILS, PER CARTON OF 50	5.00

Write for prices on lithographed pails.

Above packed in cartons which are dust proof, light, and easy to handle, keeping your cans and pails clean until you are ready to use them.

5-POUND PAILS, PER CASE OF 12	$1.10
10-POUND PAILS, PER CASE OF 6	.90
60-POUND CANS, 1 PER CASE	.90
60-POUND CANS, 2 PER CASE	1.25

Above packed in wooden reshipping cases.

Glass Jars

8-OZ. HONEY CAPACITY, TALL OR FLUTED, PER CASE OF 24	$1.05
16-OZ. HONEY CAPACITY, TALL OR FLUTED, PER CASE OF 24	1.35
32-OZ HONEY CAPACITY, PER CASE OF 12	.95

All above prices F. O. B. Reedsville, Wisconsin. Write for prices on large quantities of pails and glass jars, stating number and sizes wanted.

Sections

4¼ x 4¼ x 1½-INCH PLAIN NO. 2, PER 1000	$7.50
4 x 5 x 1⅞-INCH PLAIN NO. 2, PER 1000	8.00
4¼ x 4¼ x 1⅞-INCH BEEWAY NO. 2, PER 1000	9.00

SAVE MONEY on your supplies by getting our quotations on your requirements.

A. H. Rusch & Son Co., Reedsville, Wisconsin

Carload quantities of ROOT goods and AIRCO FOUNDATION stocked here in Pueblo, to insure the best of service to Colorado producers. Write for our special prices.

Chas. Kastning

DISTRIBUTOR

1105 Cypress Street, Pueblo, Colorado

Carload quantities of ROOT GOODS ready for prompt shipments. We promise Kansas producers the utmost in satisfaction and service.

A. V. SMALL

AUGUSTA, KANSAS

You can have cash for your wax and old combs or cappings at the market price, or we allow a little more in exchange for supplies. Write for our terms and prices.

"Falcon"

Supplies--Queens--Foundation

W. T. Falconer Mfg. Company

Falconer, New York (near Jamestown)

"Where the best beehives come from."

Ask for catalog. *Booklet, "Simplified Beekeeping for Beginners," free.*

Superior Italian Queens

To June 15: *Untested, 1, $1.00; 10, 85c each; 100, 75c each. Tested, 50c more.*

After June 15: *Untested, 1, 80c; 10, 75c each; 100, 60c each. Tested, 50c more.*

Prompt Shipment---Absolute Satisfaction Guaranteed

Three Thousand Nuclei

THE STOVER APIARIES

Tibbee, Miss. **Telegraph Office, Mayhew, Miss.**

QUEENS :: PACKAGE BEES

Knight's *Line-Bred, Pure, Three-Banded, Leather-Colored* *Italians*

For hardiness, prolificness, gentleness, and honey-gathering qualities they cannot be excelled. Several northern beekeepers inform me my queens cleaned them of European foul brood last season, enabling them to secure a honey crop.

Prices, Select (one grade) Untested

1 to 4.....	$1.00 each	10 to 14.....	$0.80 each
5 to 9.....	.90 each	15 and more....	.75 each

All queens guaranteed mated pure, and to give perfect satisfaction. Can still make immediate shipment of 2-lb. packages with queens, price $5.00 f. o. b. buyer's address.

JASPER KNIGHT, HAYNEVILLE, ALA.

CITRONELLE QUEENS

IN THE NORTH

Our strain of Italians winters well in the North
Read the following letter:

Juntura, Ore., March 20, 1925.

Citronelle Apiaries, Citronelle, Ala.

Dear Sirs:—Enclosed find my check for $10.00 for which send me 12 of your queens. The queens I bought of you last fall are fine and they all wintered in good shape, although we had the coldest winter ever recorded here. There were times when we had 48 degrees below zero, but colonies headed with your queens came through in the best shape of any in my apiary of 114 colonies. Yours very truly,

CURTIS WHARTON.

QUEENS Untested, 75c each; 12 for $8.40, or 100 for $60.00. Select Untested, $1 ea.; 12 for $9.00, or 100 for $70.00. Tested queens, $1.50: breeders, $5.00 to $25.00 each.

PACKAGE BEES Young queen furnished in each package. 2-lb. package, $3.00 each, any number; 3-lb. packages, $4.00 each, any number.

Health certificate with each shipment.
Satisfaction and prompt service guaranteed.

Citronelle Apiaries, Citronelle, Ala.

HOFFMAN & HAUCK, Inc.

1331 Ocean Ave. Ozone Park, L. I., New York

Glass and Tin Honey Containers

2½-pound Cans, in cartons of 100	$4.00 a carton
5-pound Pails, in cartons of 50	3.50 a carton
10-pound Pails, in cartons of 50	5.00 a carton
60-pound Tins, new, 2 tins per case	1.00 each
160-lb. Kegs (the ideal container for both buckw't & clover honey)	1.20 each

Glass Jars with Gold-Lacquered Caps

16-ounce honey capacity, 2 dozen per carton	$1.20 per carton
3-pound or quart capacity, 1 dozen per carton	.90 per carton

Special Hazel-Atlas Tall Jars, Including Caps

8-ounce honey capacity, 2 dozen per carton	$1.05 per carton
16-ounce honey capacity, 2 dozen per carton	1.35 per carton
2-pound honey capacity, 1 dozen per carton	.95 per carton

Honey for Road Stands

White Clover, 60-pound tins, crystallized	13c per lb.
White Clover, 60-pound tins, liquid	14c per lb.
L. A. Southern, 60-pound tins, liquid	12c per lb.

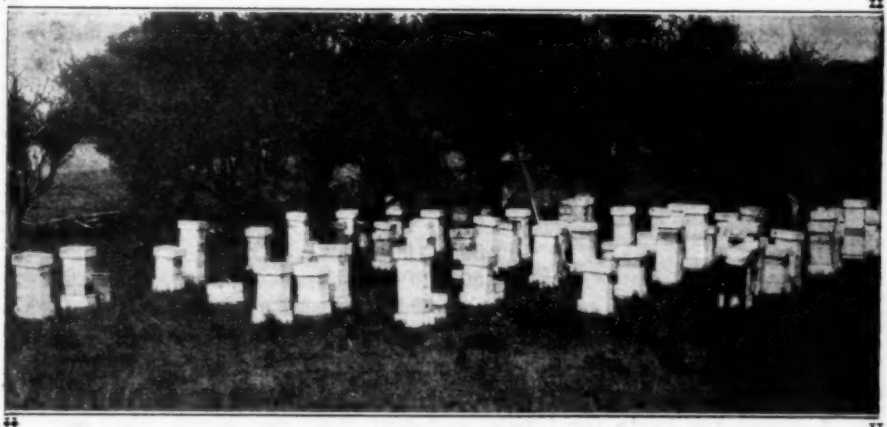
Do not buy your

BEE SUPPLIES

until you have our prices. Send us a list of your needs and we will quote you prices that will enable you to save money. Special discount to association members.

ROOT QUALITY QUEENS

Known the World Over as the Best



One of our 20 Apiaries at Medina, Ohio. Photographed August 1, 1924.

Three-Banded Italians

Prolific - Uniformly Marked - Disease Resistant
Vigorous - Hardy

QUEEN PRICES

Quantity:	1 to 9	10 to 24.	25 to 49.	50 to 99.	100 or over.
Untested	$1.50 each.	$1.35 each.	$1.25 each.	1.10 each.	$1.00 each.
Select Untested..	2.00 each.	1.80 each.	1.70 each.	1.55 each.	1.45 each.

Tested, $2.50 each; Select Tested, $3.00 each.

OUR GUARANTEE ON QUEENS

We guarantee safe arrival of queens sent in mailing cages, except as noted at end of this paragraph. We agree to refund the money or replace the queen if the one first sent arrives dead, provided the beekeeper receiving the dead or unfit queen notifies us and returns her at once and in her own shipping cage, properly marked with name and address of the sender. No delay in returning the queen can be permitted. This guarantee applies only on queens sent to customers in Canada and the United States, but not to her possessions.

PRICES OF BEES

IN TWO-POUND COMBLESS PACKAGES BY EXPRESS, TO AUGUST 15.

	1 to 9 pkg.	10 to 24 pkgs.	25 or more pkgs.
2-pound package of bees.....	$5.00 each.	$4.50 each.	$4.00 each.

Add price of queens wanted to package price given above. Large quantity lots quoted on application. These prices are F. O. B. Medina, Ohio.

The A. I. Root Company, Medina, Ohio, U.S.A.

HONEY CONTAINERS

FRICTION-TOP PAILS AND CANS

	25	50	100	200	500	1000
2½-pound cans	$1.30	$2.40	$4.15	$8.25	$20.00	$39.00
5-pound pails	2.00	3.50	7.00	13.75	33.00	64.00
10-pound pails	2.90	5.00	10.00	19.75	48.00	94.00

FIVE-GALLON CANS

60-lb. Cans, 2 cans to the case f. o. b. Lansing.		60-lb. Cans, 2 cans to the case f. o. b. cars Detroit	
Per case	$ 1.20	50 cases	$ 51.00
10 cases	11.50	100 cases	98.00
25 cases	28.50	200 cases	192.00

5-gallon cans in bulk, $9.25 per crate of 24.

Above pails are packed 50 to the carton and will keep bright and clean until time of using. 2½-pound cans, 100 to carton. Above prices are f. o. b. cars Lansing.

A grade tin paste for labels, per pint, 25c; per quart, 45c; per gallon, $1.50.

GLASSWARE

	1 case	10 cases	30 cases
6½-ounce tumblers, 48 to case	$1.35	$13.00	$37.00
16-ounce round jars, 24 to case	1.35	13.00	36.50

CORRUGATED-PAPER SHIPPING CASES

These cases provide an inexpensive package for handling comb honey. They are partitioned so that each section is in its own compartment.

	10	50	100
24 4¼x4¼x1⅞-inch Sections	$2.20	$10.75	$21.00
24 4¼x4¼x1½-inch Sections	2.00	9.75	19.00
24 4 x5 x1⅜-inch Sections	1.90	9.25	18.00

ADHESIVE

We furnish adhesive for sealing the corrugated paper shipping cases as follows: 1 pint, 15c; 1 quart, 20c; 1 gallon, 60c. Order one pint of adhesive for each 10 cases, or 1 gallon for each 100 cases purchased.

We also furnish lithographed honey pails, cartons for comb honey, and display and wood comb-honey cases.

M. H. HUNT & SON

510 N. Cedar St. Lansing, Michigan